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ESTIMATED ENERGY R&D FUNDING BY THE GOVERNMENTS OF THE PROVINCES AND TERRITORIES IN 1978-79, 1979-80 AND 1980-81

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INTRODUCTION

This document updates the report published[1] by the Office of Energy Research and Development (OERD) in June 1979. The listing of the projects has been compiled by OERD from information supplied by the Governments and Agencies of the Provinces and Territories[2]. Estimated expenditures are given to indicate the level of activity for each project. They are also summarized by R&D area and Province in the Summary Tables A, B, C and D.

In order to provide a common base of reporting, OERD has identified in Table I expenditures on energy research and development (R&D) which are solely provincial and territorial; not included are the federal share of cost-shared agreements and the share of R&D funding provided by the provincial power utilities. Projects funded by these utilities are listed in Table IV. Energy Resource assessment work is not strictly energy R&D. Projects carrying out energy resource assessment activities have been listed in Table II.

Many projects reported could not be classified as pure R&D projects. The Ministry of State for Science and Technology[3] limits R&D work to "creative work undertaken on a systematic basis to increase the stock of scientific knowledge and technology". Yet, related scientific activities (RSA), including scientific data collection, scientific information services, testing and standardization, and feasibility, operations and policy studies, are sometimes difficult to dissociate from R&D work, and often largely contribute to the advancement of R&D. To accommodate these elements inherent in technical and scientific activities, all projects including R&D and/or RSA have nevertheless been compiled in the main tables of the second part of this document. Only those projects dealing with high capital cost demonstration and commercialization have been excluded from the main tables; they are grouped in Table III. Grey areas exist here, particularly with respect to prototypes and pilot projects. Some demonstration projects (or part of them) are undertaken under federal-provincial bilateral agreements[4]; such projects frequently constitute a large fraction of expenditures reported by Provinces and Territories.

OERD gratefully acknowledges the assistance of the Governments of the Provinces and Territories and various Power Utilities, which are listed with the names of contact persons in Appendix A.

A list of selected reports, available from Provincial and Territorial governments and Agencies, is included in Appendix B.

Footnotes:

[1] Estimated Energy R&D Funding by Provincial Governments in 1976-77, 1977-78 and 1978-79. Energy, Mines and Resources Canada, REPORT ER-79-5, June 1979.

Footnotes (ctd):

[2] An Accession List of publications, available from these Governments and Agencies, as well as from power utilities and other sources, is available upon request from OERD. This Accession List is updated several times a year.

[3] Federal Science Activities 1980-81, Ministry of State, Science and Technology, 1980.

[4] Principal amongst these are the Alberta-Canada Energy Resources Research Fund (ACERRF) and the Federal-Provincial Conservation and Renewable Energy Development Agreements (CREDA's).

ACERRF is funded at a level of $96 million over 6 years (1976-82), and focuses on fossil fuel research of direct interest to Alberta and the western provinces.

The federal financial participation in CREDA's over the five year period (1979-84) is authorized at $133 million, the provincial-territorial involvement totals $96 million and these together with the financial participation of the proponents bring the program total to approximately $300 million.

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CLASSIFICATION OF ENERGY R&D AREAS

ENERGY CONSERVATION

1.1 Industrial Energy R&D (Federal IERD Program)
1.2 Industrial Sector
1.3 Agriculture & Food Sector
1.4 Building Sector
1.5 Transportation Sector
1.6 Demand
1.7 Energy Systems
1.8 Planning, Coordination & Management

OIL SANDS AND HEAVY OILS; COAL SUPPLY AND COMBUSTION

2.1 Oil Sands and Heavy Oils
2.2 Coal Supply
2.3 Coal Combustion
2.4 Environment

NUCLEAR ENERGY

3.1 Regulatory Support - Fission & Fusion
3.2 Fuel Resource Base - Fission & Fusion
3.3 Utilization and Support - Fission & Fusion
3.4 Nuclear Fusion - Basic Research

RENEWABLE ENERGY SOURCES

4.1 Hydraulics
4.2 Solar
4.3 Bioenergy
4.4 Wind
4.5 Geothermal
4.6 Peat

NEW LIQUID FUELS

5.1 Direct Liquefaction
5.2 Gasification
5.3 Biological Processes
5.4 Fuels Processing
5.5 Fuel Use
5.6 Hydrogen and Electrochemistry
5.7 Environment
5.8 Planning, Coordination and Management

CONVENTIONAL ENERGY SYSTEMS: OIL, GAS, AND ELECTRICITY

6.1 Earth Sciences
6.2 Marine Production Engineering & Environmental Prediction
6.3 Offshore Geotechnics
6.4 Enhanced Recovery
6.5 Materials
6.6 Transportation of Oil & Gas
6.7 Environment
6.8 Electrical R&D

GENERAL COORDINATION

PART I: SUMMARY TABLES

TABLE A

ESTIMATED PROVINCIAL ENERGY R&D EXPENDITURES

1978-79 to 1980-81

(Current $000)

	1978-79	1979-80	1980-81
Alberta	35,482.2	42,083.2	29,056.5
British Columbia	3,237.0	3,597.2	3,936.3
Manitoba	----	----	1,302.0
New Brunswick	551.1	296.9	101.5
Newfoundland	----	85.5	227.5
Northwest Territories	----	----	560.0
Nova Scotia	8,548.0	5,081.2	8,359.4
Ontario	25,092.0	25,590.6	35,532.5
Prince Edward Island	380.0	301.0	508.5
Quebec	17,978.4	17,991.5	19,524.5
Saskatchewan	3,949.3	6,767.9	7,899.9
Yukon Territory		no programs reported	
TOTAL	95,218.0	101,795.0	107,008.6

TABLE B (1)

ESTIMATED PROVINCIAL ENERGY RESEARCH & DEVELOPMENT EXPENDITURES 1978-79, BY R&D AREA

(Current $ 000)

R&D AREA	ALTA	B.C.	MAN	N.B.	NFLD	NWT	N.S.	ONT	PEI	QUE	SASK	TOTAL
CONSERVATION												
1.0	-	-	-	-	-	-	-	-	100.0	-	-	100.0
1.2	54.8	35.0	-	-	-	-	150.0	660.0	40.0	114.9	19.6	1074.3
1.3	-	1.0	-	2.4	-	-	-	85.0	-	4.0	36.5	128.9
1.4	19.3	32.0	-	208.0	-	-	516.0	805.0	-	4.8	465.4	2050.5
1.5	9.5	-	-	-	-	-	-	365.0	-	-	-	374.5
1.6	-	-	-	-	-	-	-	1016.0	-	-	4.5	1020.5
1.7	-	-	-	-	-	-	-	-	-	-	-	-
1.8	-	-	-	-	-	-	-	-	-	-	-	-
CONSERVATION TOTAL	83.6	68.0	-	210.4	-	-	666.0	2931.0	140.0	123.7	526.0	4748.7
OILS SANDS, HEAVY OILS, COAL SUPPLY & COMBUSTION												
2.1	31400.0	-	-	-	-	-	-	-	-	-	1409.1	32809.1
2.2	306.9	-	-	-	-	-	7200.0	-	-	-	59.0	7565.9
2.3	-	238.4	-	250.0	-	-	-	-	-	-	0.5	488.9
2.4	-	-	-	-	-	-	-	-	-	-	1.7	1.7
OILS SANDS, HEAVY OILS, COAL SUPPLY & COMBUSTION TOTAL	31706.9	238.4	-	250.0	-	-	7200.0	-	-	-	1470.3	40865.6
NUCLEAR												
3.1	-	-	-	-	-	-	-	-	-	-	2.1	2.1
3.2	-	-	-	-	-	-	-	340.0	-	-	757.5	1097.5
3.3	-	-	-	-	-	-	-	3223.0	-	-	-	3223.0
3.4	-	-	-	-	-	-	-	19.0	-	-	-	19.0
NUCLEAR TOTAL	-	-	-	-	-	-	-	3582.0	-	-	759.6	4341.6

TABLE B (2)

ESTIMATED PROVINCIAL ENERGY RESEARCH & DEVELOPMENT EXPENDITURES 1978-79, BY R&D AREA

(Current $ 000)

R&D AREA	ALTA	B.C.	MAN	N.B.	NFLD	NWT	N.S.	ONT	PEI	QUE	SASK	TOTAL
RENEWABLES												
4.0	-	-	-	-	-	-	-	-	-	-	30.8	30.8
4.1	-	55.0	-	-	-	-	70.0	-	-	-	4.7	129.7
4.2	568.2	89.0	-	41.3	-	-	50.0	1755.0	15.0	264.0	168.6	2951.1
4.3	-	-	-	40.9	-	-	460.0	75.0	9.0	211.0	24.0	819.9
4.4	-	33.6	-	8.5	-	-	17.0	290.0	81.0	3.0	60.5	493.6
4.5	42.7	1599.8	-	-	-	-	-	-	-	-	30.0	1672.5
4.6	-	-	-	-	-	-	-	430.0	-	-	32.3	462.3
4.7	-	-	-	-	-	-	-	-	-	-	-	-
RENEWABLES TOTAL	610.9	1777.4	-	90.7	-	-	597.0	2550.0	105.0	478.0	350.9	6559.9
NEW LIQUID FUELS												
5.1	500.0	-	-	-	-	-	85.0	132.0	-	-	6.9	723.9
5.2	-	-	-	-	-	-	-	80.0	135.0	135.0	50.8	400.8
5.3	27.7	-	-	-	-	-	-	30.0	-	-	24.0	81.7
5.4	1241.2	-	-	-	-	-	-	-	-	-	-	1241.2
5.5	-	-	-	-	-	-	-	39.0	-	-	-	39.0
5.6	-	-	-	-	-	-	-	2.0	-	-	105.3	107.3
5.7	-	-	-	-	-	-	-	-	-	-	-	-
5.8	-	-	-	-	-	-	-	-	-	-	-	-
NEW LIQUID FUELS TOTAL	1768.9	-	-	-	-	-	85.0	283.0	135.0	135.0	187.0	2593.9
CONVENTIONAL OIL, GAS & ELECTRICITY												
6.1	364.2	-	-	-	-	-	-	80.0	-		222.0	666.2
6.2	-	-	-	-	-	-	-	-	-	-	-	-
6.3	-	-	-	-	-	-	-	-	-	-	-	-
6.4	947.7	-	-	-	-	-	-	-	-	-	34.6	982.3
6.5	-	16.5	-	-	-	-	-	-	-	-	-	16.5
6.6	-	-	-	-	-	-	-	1300.0	-	-	42.0	1342.0
6.7	-	-	-	-	-	-	-	-	-	-	-	-
6.8	-	1136.7	-	-	-	-	-	14366.0	-	17241.7*	356.9	33101.3
CONVENTIONAL OIL, GAS & ELECTRICITY TOTAL	1311.9	1153.2	-	-	-	-	-	15746.0	-	-	655.5	18866.6
GRAND TOTAL	35482.2	3237.0	-	551.1	-	-	8548.0	25092.0	380.0	17978.4	3949.3	95218.0

* Including all the energy R&D of the Institut de Recherche de Hydro-Québec (IRHQ)

TABLE C (1)

ESTIMATED PROVINCIAL ENERGY RESEARCH & DEVELOPMENT EXPENDITURES 1979-80, BY R&D AREA

(Current $ 000)

R&D AREA	ALTA	B.C.	MAN	N.B.	NFLD	NWT	N.S.	ONT	PEI	QUE	SASK	TOTAL
CONSERVATION												
1.0	-	-	-	-	-	-	-	-	100.0	-	-	100.0
1.2	172.9	672.2	-	-	-	-	11.2	1077.6	5.0	59.0	21.5	2019.4
1.3	-	1.0	-	-	-	-	22.3	190.0	11.0	24.2	61.0	309.5
1.4	151.6	54.0	-	16.5	1.3	-	475.0	929.5	-	-	353.6	1981.5
1.5	3.3	-	-	-	-	-	-	467.0	-	-	2.2	472.5
1.6	-	5.0	-	-	-	-	-	854.7	-	-	10.5	870.2
1.7	-	-	-	-	-	-	-	-	-	-	-	-
1.8	-	-	-	-	-	-	1.4	64.0	-	-	-	65.4
CONSERVATION TOTAL	327.8	732.2	-	16.5	1.3	-	509.9	3582.8	116.0	83.2	448.8	5818.5
OILS SANDS, HEAVY OILS, COAL SUPPLY & COMBUSTION												
2.1	38156.8	-	-	-	-	-	-	-	-	-	4097.2	42254.0
2.2	518.0	-	-	-	-	-	4100.0	-	-	-	36.0	4654.0
2.3	-	89.2	-	200.0	-	-	-	-	-	-	12.2	301.4
2.4	-	-	-	-	-	-	-	-	-	-	11.5	11.5
OILS SANDS, HEAVY OILS, COAL SUPPLY & COMBUSTION TOTAL	38674.8	89.2	-	200.0	-	-	4100.0	-	-	-	4156.9	47220.9
NUCLEAR												
3.1	-	-	-	-	-	-	-	-	-	-	3.9	3.9
3.2	-	-	-	-	-	-	-	-	-	-	624.0	624.0
3.3	-	-	-	-	-	-	-	5085.0	-	-	-	5085.0
3.4	56.2	-	-	-	-	-	-	-	-	-	-	56.2
NUCLEAR TOTAL	56.2	-	-	-	-	-	-	5085.0	-	-	627.9	5769.1

TABLE C (2)

ESTIMATED PROVINCIAL ENERGY RESEARCH & DEVELOPMENT EXPENDITURES 1979-80, BY R&D AREA

(Current $ 000)

R&D AREA	ALTA	B.C.	MAN	N.B.	NFLD	NWT	N.S.	ONT	PEI	QUE	SASK	TOTAL
RENEWABLES												
4.0	-	5.0	-	-	-	-	-	-	-	-	42.8	47.8
4.1	-	131.6	-	-	-	-	12.5	-	-	-	19.0	163.1
4.2	425.2	188.6	-	-	-	-	13.7	490.3	15.0	134.2	279.2	1546.2
4.3	-	-	-	78.2	76.0	-	136.0	134.0	10.0	-	43.9	478.1
4.4	-	133.6	-	2.2	8.2	-	301.3	26.5	65.0	49.0	33.0	618.8
4.5	55.9	1130.8	-	-	-	-	-	-	-	-	-	1186.7
4.6	-	-	-	-	-	-	-	-	-	-	56.0	56.0
4.7	-	-	-	-	-	-	-	-	-	-	-	-
RENEWABLES TOTAL	481.1	1589.6	-	80.4	84.2	-	463.5	650.8	90.0	183.2	473.9	4096.7
NEW LIQUID FUELS												
5.1	300.0	50.0	-	-	-	-	-	-	-	-	26.7	376.7
5.2	-	-	-	-	-	-	-	9.4	95.0	-	79.1	183.5
5.3	-	-	-	-	-	-	-	54.6	-	-	65.0	119.6
5.4	493.9	-	-	-	-	-	-	-	-	-	-	493.9
5.5	-	-	-	-	-	-	-	40.0	-	-	-	40.0
5.6	-	66.0	-	-	-	-	-	-	-	-	94.6	160.6
5.7	-	-	-	-	-	-	-	-	-	-	-	-
5.8	-	-	-	-	-	-	-	-	-	-	-	-
NEW LIQUID FUELS TOTAL	793.9	116.0	-	-	-	-	-	104.0	95.0	-	265.4	1374.3
CONVENTIONAL OIL, GAS & ELECTRICITY												
6.1	496.5	-	-	-	-	-	-	-	-	-	240.0	736.5
6.2	-	-	-	-	-	-	-	-	-	-	-	-
6.3	-	-	-	-	-	-	-	-	-	-	-	-
6.4	1252.9	-	-	-	-	-	-	-	-	-	44.4	1297.3
6.5	-	4.7	-	-	-	-	-	-	-	-	-	4.7
6.6	-	-	-	-	-	-	-	1900.0	-	-	59.3	1959.3
6.7	-	-	-	-	-	-	-	-	-	-	-	-
6.8	-	1065.5	-	-	-	-	5.0	14268.0	-	17725.1*	451.3	33515.0
CONVENTIONAL OIL, GAS & ELECTRICITY TOTAL	1749.4	1070.2	-	-	-	-	5.0	16168.0	-	-	795.0	19787.6
7.1	-	-	-	-	-	-	2.8	-	-	-	-	2.8
GRAND TOTAL	42083.2	3597.2	-	296.9	85.5	-	5081.2	25590.6	301.0	17991.5	6767.9	101795.0

* Including all the energy R&D of the Institut de Recherche de Hydro-Québec (IREQ)

TABLE D (1)

ESTIMATED PROVINCIAL ENERGY RESEARCH & DEVELOPMENT EXPENDITURES 1980-81, BY R&D AREA

(Current $ 000)

R&D AREA	ALTA	B.C.	MAN	N.B.	NFLD	NWT	N.S.	ONT	PEI	QUE	SASK	TOTAL
CONSERVATION												
1.0	-	16.2	-	-	-	-	-	200.0	-	299.6	597.5	1113.3
1.2	95.6	20.0	5.9	-	-	-	36.0	956.0	16.0	363.0	74.1	1566.6
1.3	-	18.0	-	-	-	-	0.3	-	-	23.5	50.5	92.3
1.4	358.3	20.0	189.8	5.0	109.2	560.0	514.8	729.5	21.0	-	502.7	3010.3
1.5	8.5	25.6	90.0	-	-	-	10.0	1085.0	21.0	-	6.8	1246.9
1.6	-	15.0	-	-	-	-	-	1253.0	-	-	6.4	1274.4
1.7	-	-	-	-	-	-	-	-	-	-	-	-
1.8	-	-	-	-	-	-	-	400.0	-	-	-	400.0
CONSERVATION TOTAL	462.4	114.8	285.7	5.0	109.2	560.0	561.1	4623.5	58.0	686.1	1238.0	8703.8
OILS SANDS, HEAVY OILS, COAL SUPPLY & COMBUSTION												
2.1	23630.8	-	-	-	-	-	-	-	-	-	3648.5	27279.3
2.2	1037.3	62.0	-	-	-	-	330.0	-	-	-	141.0	1570.3
2.3	-	-	-	-	-	-	-	-	-	-	36.7	36.7
2.4	-	-	-	-	-	-	-	-	-	-	18.9	18.9
OILS SANDS, HEAVY OILS, COAL SUPPLY & COMBUSTION TOTAL	24668.1	62.0	-	-	-	-	330.0	-	-	-	3845.1	28905.2
NUCLEAR												
3.1	-	-	-	-	-	-	-	-	-	-	8.0	8.0
3.2	-	-	-	-	-	-	-	-	-	-	772.6	772.6
3.3	-	-	-	-	-	-	-	8446.0	-	-	-	8446.0
3.4	195.3	50.0	-	-	-	-	-	57.0	-	1170.6	-	1472.9
NUCLEAR TOTAL	195.3	50.0	-	-	-	-	-	8503.0	-	1170.6	780.6	10699.5

TABLE D (2)

ESTIMATED PROVINCIAL ENERGY RESEARCH & DEVELOPMENT EXPENDITURES 1980-81, BY R&D AREA

(Current $ 000)

R&D AREA	ALTA	B.C.	MAN	N.B.	NFLD	NWT	N.S.	ONT	PEI	QUE	SASK	TOTAL
RENEWABLES												
4.0	-	-	350.0	-	-	-	-	1000.0	-	-	615.8	1965.8
4.1	-	241.5	-	-	-	-	7007.6		6.0	-	14.3	7269.4
4.2	355.6	283.9	29.1	-	0.6	-	31.0	2269.0	64.5	278.5	268.1	3580.3
4.3	-	30.8	250.0	96.5	111.5	-	33.0	1623.0	125.0	318.1	6.9	2594.8
4.4	-	40.4	-	-	6.2	-	283.0	298.0	152.0	1251.0	15.2	2045.8
4.5	80.0	1682.5	-	-	-	-	-	-	-	-	-	1762.5
4.6	-	-	-	-	-	-	20.0	-	-	-	107.6	127.6
4.7	-	-	-	-	-	-	-	-	-	-	-	-
RENEWABLES TOTAL	435.6	2279.1	629.1	96.5	118.3	-	7374.6	5190.0	347.5	1847.6	1027.9	19346.2
NEW LIQUID FUELS												
5.1	768.0	21.0	-	-	-	-	85.0	67.0	-	-	25.0	966.0
5.2	-	-	-	-	-	-	-	295.0	-	-	72.9	367.9
5.3	-	-	-	-	-	-	-	240.0	100.0	-	-	340.0
5.4	567.1	-	-	-	-	-	-	-	-	-	-	567.1
5.5	-	-	302.2	-	-	-	-	175.0	-	-	-	477.2
5.6	-	171.5	-	-	-	-	-	100.0	-	1099.8	39.7	1411.0
5.7	-	-	-	-	-	-	-	-	-	-	-	-
5.8	-	-	85.0	-	-	-	-	-	-	-	-	85.0
NEW LIQUID FUELS TOTAL	1335.1	192.5	387.2	-	-	-	85.0	877.0	100.0	1099.8	137.6	4214.2
CONVENTIONAL OIL, GAS & ELECTRICITY												
6.1	200.0	-	-	-	-	-	-	-	-	-	260.0	460.0
6.2	-	-	-	-	-	-	-	-	-	-	-	-
6.3	-	-	-	-	-	-	-	-	-	-	-	-
6.4	1760.0	-	-	-	-	-	-	-	-	-	44.5	1804.5
6.5	-	42.0	-	-	-	-	-	-	-	-	-	42.0
6.6	-	-	-	-	-	-	-	-	-	-	71.8	71.8
6.7	-	-	-	-	-	-	-	-	-	-	-	-
6.8	-	1195.9	-	-	-	-	8.7	16339.0	3.0	14720.4	494.4	32761.4
CONVENTIONAL OIL, GAS & ELECTRICITY TOTAL	1960.0	1237.9	-	-	-	-	8.7	16339.0	3.0	14720.4	870.7	35139.7
GRAND TOTAL	29056.5	3936.3	1302.0	101.5	227.5	560.0	8359.4	35532.5	508.5	19254.5	7899.9	107008.6

TABLE I: ENERGY R & D PROJECTS FUNDED BY PROVINCIAL GOVERNMENTS

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 1: CONSERVATION					
1.2	**Industrial Sector**				
	Alberta				
	The beneficial utilization of thermal discharges from power plants in Alberta.	U of A	15.0		
	Examine the technical and economic feasibility of utilizing the Rossdale electric energy generating plant to provide district heating in central Edmonton	ENR		66.4	33.6
	Efficient utilization of low heating value fuels	ENR		23.3	28.5
	Improving energy and resource conservation through optimum processing of sour gas	ENR			
	Control of energy losses caused by microbial fouling of heat exchangers in thermal energy recovery operations	ENR	39.8	55.0	
	Production of hydrogen and sulphur from thermal decomposition of hydrogen sulphide by metal catalysts	ENR		28.2	33.5
	British Columbia				
	Feasibility study of the concept of cogeneration for the Metropolitan Victoria Area based on the use of refuse derived fuel	MEMPR		65.0	
	Energy conversion efficiency enhancement using shock Waves	SCBC			20.0
	Pulp mill energy usage scheduling	SCBC		8.7	
	Utilization of B.C. coal washery and mining rejects	SCBC		24.5	
	A Study of cogeneration in British Columbia	BCEC BCHPA	35.0		

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.2	Industrial Sector (cont'd)				
	Manitoba				
	Utilizing waste heat from ice plant to warm storage water to heat the curling rink and skating rink waiting rooms	EM			5.9
	Recover waste heat from flue gases Canada Packers	EM			
	Nova Scotia				
	A study to determine the technical and economic feasibility of utilizing the waste heat from a back pressure turbine for district heating in down-town Halifax	NSME	150.0		
	Ontario				
	By product energy study/reject heat from nuclear stations	MAF	70.0		
	Engineering design; technical and economic assessments of district heating	MH NPDC	100.0		
	Industrial activities for energy conservation	ME			100.0
	Autothermal sludge incineration study	MEnv ME CMHC	60.0		
	Use of refuse derived fuel in cement Kilns	MEnv	40.0		
	Provide assessment and prototype development assistance to Ontario inventors of energy conservation and renewable energy systems	ME	60.0		
	Research into potential for industrial cogeneration	ME			30.0
	Assistance to innovative energy technology	ME			460.0

TABLE 1 (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.2	Industrial Sector (cont'd)				
	Ontario (cont'd)				
	Hearst wood waste cogeneration plant design	ME	150.0		
	Northern cogeneration energy plant location study	ME	80.0		
	Municipal energy from waste development projects	ME		182.6	116.0
	Use of marshes for sewage purification (testing for 3 years)	MEnv		725.0	
	Prince Edward Island				
	Charlottetown area garbage incinerator	EC	40.0	5.0	5.0
	District heating study - Charlottetown	EC			11.0
	Quebec				
	Use of thermal waste from a factory for greenhouse farming by means of heated mulching	DPEN		35.0	
	Strategic, economic and technical study from promoting district heating throughout Quebec.	DPEN		24.0	
	The establishment of a plant for manufacturing solid fuel by recovering urban waste.	DPEN	58.7		
	Study concerning the setting up of a power station which burns urban waste to heat approximately forty buildings with a total area of 1.8 million square metres in Montreal.	DPEN	25.0		
	Study of the potential of heat pumps in residential, commercial and industrial sectors throughout Quebec	DPEN			44.9
	Inventory and charting of subsurface water for heating by means of heat pumps	DPEN	31.2		

TABLE 1 (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.2	Industrial Sector (cont'd)				
	Saskatchewan				
	Greenhouse heating using waste heat	SSC			2.0
	Use of waste stack gas to heat greenhouse	SRC		7.0	
1.3	Agriculture & Food Sector				
	British Columbia				
	Greenhouse root heating	MEMPR			8.0
	Feasibility of implementing solar heating of fish hatchery water as an alternative which reduces energy costs in existing or newly planned hatcheries	SCBC			10.0
	Optimum design building concepts for solar greenhouses	MEMPR	1.0	1.0	
	Nova Scotia				
	Solar assisted insulated greenhouse	NSAC		1.3	0.3
	Study of the potential for small greenhouse heating with wood	NSME		21.0	
	Ontario				
	Solar heating in greenhouses	MNA	30.0		
	Studying greenhouse fuel usage	MAF	25.0		
	Investigating grain drying systems	MAF	20.0	20.0	
	Studying field production efficiency, including an analysis of reduced fillage operation; study hay harvesting	MAF	10.0		
	Design of an energy self-sufficient farm	MAF		20.0	
	Energy conservation in greenhouses-ornamentals, heating, and environmental manipulation	MAF		150.0	

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.3	**Agriculture & Food Sector (cont'd)**				
	Prince Edward Island Cold calf-housing, bulk milk heat exchangers, sow barn heat exchangers	A		11.0	
	Quebec Development of new means of energy production, storage and management in an experimental greenhouse adapted to Quebec conditions.	UM		24.2	
	Installation of a greenhouse with a heating system which uses wood or residue.	DPEN			3.5
	Greenhouse which uses a gravel storage system under the greenhouse floor. School educational project.	DPEN	4.0		
	Saskatchewan Energy Inputs into Saskatchewan Agriculture	SSC	1.5	16.0	
	Use of wood waste to heat greenhouse	DNS		8.0	
	Selection of option in machinery size on individual Saskatchewan farms	SSC	3.0	3.0	2.5
	Study of energy equipments of different agronomic practices	AG;SRC	27.0	31.0	45.0
	Heat recovery in livestock buildings using an air-to-air heat exchanger	AG	5.0	3.0	3.0
1.4	**Building Sector**				
	Alberta Facility for study of energy conservation and solar heating houses	ENR		140.8	40.3
	Investigation of techniques and determination of their effectiveness for thermally upgrading existing membrane roofs	ENR	19.3	10.8	18.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.4	Building Sector (cont'd)				
	British Columbia				
	Arial thermography	MEMPR	32.0	54.0	20.0
	Manitoba				
	Pilot course for the training of building operators in methods and procedures to optimize the conservation of energy in buildings	MHRC			14.5
	Design & construction of an infiltration device, complete with technician testing, usage monitoring and sample testing of five homes	EM			3.3
	Energy efficient home, new wall construction method, plus use of lossonay heat exchanger	EM			5.0
	Ontario				
	Monitoring, assessment and reporting for commercial sector projects	ME	80.0		
	Thermal performance guidelines	ME	70.0		
	Development of computer based building system analysis, including integration of solar energy and thermal storage for new construction in public sector including life cycle analysis and computer data banks	MGS	115.0		
	Thermography information projects and research into thermography techniques (delivery as "Heat Save") 1980-85	ME		760.0	
	Development of thermography techniques for smaller communities	ME			57.0
	Test effectiveness of thermography outreach and improve audit information systems for thermograph data	ME			35.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.4	Building Sector (cont'd) Ontario (cont'd)				
	Investigate influence of insulation on air infiltration	MHous			23.0
	Investigation of energy conservation measures in the operation of residential buildings	MHous			57.5
	Difficulties in residential chimney systems when converting to gas heating systems	MHous			30.0
	Development of selection criteria for determination of space conditioning management for apts. depending on fuel use	MHous			25.0
	Assess operating efficiencies for furnace heat distribution systems	MHous			4.0
	Investigate conservation potential of night-time set backs in hot water heated buildings	MHous			20.0
	Developments in thermostatic block heater control and minimum energy requirements	MHous			8.0
	Research in underground garage exhaust	MHous			15.0
	Investigation of "user-pays" metering	MHous			45.0
	Conservation in apartment laundry facilities	MHous			18.0
	Central vs. individual domestic hot water heating analysis	MHous			17.0
	Research into further improvements to high efficiency gas boilers for multi-unit buildings	ME			25.0
	Investigate potential of electric energy management strategies in multi-unit residential buildings	ME			10.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.4	Building Sector (cont'd)				
	Ontario (cont'd)				
	Integrated community design; life cycle costs	MH-PE	40.0		
	Identification of energy conservation opportunities in residential development	ME		45.0	15.0
	Municipal energy planning	ME			50.0
	Developing a maximum efficiency gas fired residential furnace and water heater	MCCR	75.0		
	Prince Edward Island				
	Senior citizen's housing design	HC			5.0
	Wide area monitoring of buildings	TIE			5.0
	Quebec				
	Effect of orientation on the thermal balance of a typical house (indirect solar gain, winds, airtightness).	UL	4.8		
	Saskatchewan				
	Energy conservation technology for government buildings	PGS	37.0		
	Refinement of thermographic techniques for indicating heat loss	SRC			12.0
	Study of economics of retrofitting Saskatchewan homes	SSC	3.0		
	Investigation of problems arising from increased insulation in attics	SMR, SHC, SPC, SRC	28.5	22.5	
	Energy consumption studies in rinks and pools	C&Y	10.0	10.0	10.0
	Study on energy conservation measures for homes	DNS		3.0	

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.5	Transportation Sector				
	Alberta				
	Development of novel rotary piston engine, construction and tests	ENR	9.5	2.6	0.2
	Feasibility study of improving aerodynamic properties of large highway vehicles by streamlining the "trailing edge" of such vehicles	ENR		0.7	8.3
	British Columbia				
	The effect of plasma jet ignition on a natural gas burning engine	SCBC			25.6
	Manitoba				
	Feasibility study of converting Winnipeg transit operations to non-petroleum power sources	EM			75.0
	Ontario				
	Studying auto emissions	MEnv	2.0		
	Fuel economy device evaluation	MTC	8.0	57.0	80.0
	Advisory council on energy management-reviews possible means of reducing consumption in the trucking industry	MTC	2.0	40.0	
	Fuel use measurement (Cars and Trucks)	MTC	13.0	10.0	
	Technology monitoring and review	MTC	5.0		
	Carburetor adjustment program	MTC	8.0		
	Car and van pool demonstration with large firms in the private sector	MTC	20.0	93.0	110.0
	Vehicle efficiency improvement	MTC	79.0	20.0	
	Improving MPG delivered by cars and trucks	MTC	33.0 +		

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.5	Transportation Sector				
	Ontario (cont'd)				
	Truck fuel efficiency studies and economy advisory	MTC	15.0 +		95.0
	Passenger transportation energy efficiency urban and inter city	MTC	61.0	52.0	12.0
	Possible modifications to transportation planning in light of resource constraints	MTC	14.0 +		
	Assessment of energy saving potential within MTC	MTC	19.0 +		
	Urban car-review of implications	MTC	8.0 +		
	Computer controlled traffic Signals development	MTC		20.0	360.0
	Urban Traffic and Transit Strategy feasibility	MTC			90.0
	Research on fuel saving potential of maintenance actions	MTC			135.0
	Reduced roadway illumination studies	MTC		15.0	15.0
	Paving and pavement maintenance	MTC		20.0	20.0
	Traffic management system studies	MTC		75.0	75.0
	Efficient driving behaviour and improvement	MTC	22.0 +	56.0	75.0
	Public and private sector implications of transportation energy management	MTC	21.0 +		
	Energy scenarios for reduced speed implementation	MTC	10.0 +	9.0	18.0
	Prince Edward Island				
	Auto fuel economy test program	EC			21.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.6	**Demand**				
	British Columbia				
	This field test involves 100 prototype energy cost indicators installed in households in greater Vancouver to evaluate the residential energy conservation potential when consumers are given immediate and understandable information on their energy consumption	MEMPR		5.0	15.0
	Ontario				
	Identification of incentives, and alternatives administrative structures for both private and public sector ownership	ME	60.0		
	Factors affecting acceptance of conservation package for domestic oil burners	ME		7.0	
	Monitoring of short term effectiveness and longterm impact of thermography and audit techniques	ME		18.7	
	Telecommunications/substitution for travel	MTC	50.0		80.0
	Development of energy demand forecasting models	ME	95.0		
	Saskatchewan				
	Study of energy demand scenarios	SMR	3.5		
	Research into public perception of importance of energy-conservation features of homes	SRC		1.0	
1.8	**Planning, Management & Coordination**				
	Ontario				
	Development of energy planning tools	ME		15.0	125.0
	Development of energy planning guidelines	ME		49.0	275.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 2: OIL SANDS, HEAVY OILS, COAL SUPPLY AND COMBUSTION					
2.1	**Oil Sands and Heavy Oils**				
	Alberta Support design for underground cavities in weak rock	ENR			54.6
	Basic studies into the nature of Alberta's hydrocarbon fuels, particularly oil sands and coal	ENR	200.0	456.8	376.2
	Special studies at the Alberta Research Council on the geology of Alberta oil sand deposits, the Carbonate deposit and certain site specific areas	AOSTRA		100.0	400.0
	Special studies by academic staff at Canadian universities including the Universities of Alberta, Calgary, Lethbridge, Saskatchewan, Western Ontario, Waterloo, Toronto, McGill and Sherbrooke	AOSTRA	900.0	1300.0	1400.0
	Development of Alberta scientific and engineering expertise relating to tar sand technology at the Universities of Alberta, Calgary and Lethbridge	AOSTRA	300.0	300.0	500.0
	Studies by Alberta Research Council in Basic Sciences and Process Engineering to develop technology for in-situ recovery of bitumen from the Athabasca Tar Sands	AOSTRA	1500.0	1600.0	2600.0
	Field test to develop technology for inducing horizontal fractures in deeply buried tar sand deposits	AOSTRA	100.0	200.0	
	Field test to develop technology for in-situ recovery of bitumen and heavy oil from carbonate reservoirs	AOSTRA	3300.0	2000.0	1200.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
2.1	Oil Sands and Heavy Oils				
	Alberta (cont'd)				
	Field test to develop steam and air injection technology for in-situ recovery of heavy oil from thin section oil sands deposits	AOSTRA	1300.0	5000.0	4100.0
	Experimental studies to test new ideas for flocculating suspended clays in the tailings stream from the hot water process	AOSTRA	200.0	200.0	1000.0
	Saskatchewan				
	Heavy oil technology	SRC			26.0
	Heavy oil lifting research	SO		27.7	56.3
	Enhanced recovery pilot projects	SO		502.5	1507.5
	Production and enhanced recovery research	SO		76.2	228.8
2.2	Coal Supply				
	Alberta				
	Modelling and control of coal beneficiation unit operations	ENR	31.9	40.0	
	Beneficiation and transport of the mined coal	ENR			69.3
	Coal mining research program for development, dissemination and commercialization of technology related to mining and benefication of Western Canadian coals	ENR	259.8	473.2	968.0
	British Columbia				
	Utilization of B.C. coal washery and mining rejects	SCBC			30.0
	Equipment-replacement of Differential Thermal Analysis (DTA) and Thermo-gravimetric Analysis (TGA) equipment for coal analysis	SCBC			32.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
2.2	Coal Supply (cont'd)				
	Nova Scotia				
	Coal test facility	CCB			100.0
	Comprehensive economic study of the production, preparation and utilization of coal in Nova Scotia	NSME			70.0
	Saskatchewan				
	Development of applied EDP systems for coal study	SRC			26.0
	Mannville coal deposit study	SMR			35.0
	Pipeline transportation of coal and oil	SRC			37.0
	Investigation of lignite slurries	SRC		6.0	
2.3	Coal Combustion				
	New Brunswick				
	Trial involving a coal/oil mixture combustion evaluation in an existing oil-fired generating station	NBEPC	250.0	200.0	

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 3: NUCLEAR ENERGY					
3.4	Nuclear Fusion - Basic Research				
	Alberta High Power U.F. laser system for fusion energy research	ENR			134.6
	CO_2 laser heated solenoids fusion energy research	U of A		56.2	60.7
	Ontario Plasma wall interaction studies in Tokamak fusion devices	ME	19.0		57.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 4: RENEWABLE ENERGY SOURCES					
	British Columbia				
	Feasibility study of energy alternatives for Lasqueti Island	MEMPR		5.0	
	Saskatchewan				
	Design of environmental models	SRC		6.0	
4.1	Hydraulics				
	British Columbia				
	Electric power generation from sea and fresh water	SCBC		45.0	
	Nova Scotia				
	An evaluation of the energy potential of small hydro sites in Nova Scotia	NSME	70.0		
4.2	Solar				
	Alberta				
	Application of boiling and condensation heat transfer to flat plate solar collectors in cold regions	U of A		45.7	45.0
	Study of air mediated solar heating systems with long term storage	U of A		43.0	
	Development of Alberta scientific and engineering expertise of renewable energy source technology with initial emphasis on solar and wind	ENR	539.3	310.8	290.3
	Copper oxide solar cells	ENR	28.9		
	British Columbia				
	Central multiple dwelling solar domestic hot water program	MEMPR		17.5	
	Solar access study	MEMPR	5.0		

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar (cont'd)				
	British Columbia (cont'd)				
	Photochemical solar cells using layered structure semiconductors	SCBC		30.5	31.8
	Metering to assess solar contribution of solar-thermal applications in BC environment	MEMPR	2.0	3.0	4.0
	New Brunswick				
	Installation of a solar collector in a hog finishing barn to evaluate the potential application for solar space heating	NBDARD	0.3		
	Establishment of a solar data collection system for New Brunswick with provision for multi-angle insolation measurement	NBES	9.0		
	Investigation of the application of solar energy to heat trout culture water	NBDF			1.5
	Nova Scotia				
	Solar collector evaluation for agricultural purposes	NSAC		6.0	3.0
	Economic evaluation and preliminary design for solar space heating of a new public archives building	NSPW	50.0		
	Ontario				
	Feasibility study of a combined solar space and hot water heating system	ME	20.0		
	Shading study	ME	25.0		
	Studies of production and utilization of solar energy for industrial process applications	ME	45.0	33.8	
	Solar hot water retrofit for a correctional institute	ME	70.0		

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar (cont'd)				
	Ontario (cont'd)				
	Low-cost solar assisted residential space conditioning system	MH-RD	200.0		
	Design and construction of solar mini-utility for public housing	MH-RD	25.0		
	Evaluation of package solar hot water heating system in preparation for a solar hot water initiative program	ME		45.0	
	Optimization of generic passive and active systems	ME		36.0	
	Assistance to Ontario industry in developing competitive equipment and systems	ME		4.2	
	General solar R&D	ME		6.0	
	Monitoring and assessment of existing projects as well as troubleshooting	ME			305.0
	Preliminary assessment and construction of detail designs for active solar energy systems	ME			1140.0
	Various projects, solar energy	ME			500.0
	Prince Edward Island				
	Solar assisted grain-drying; solar assisted air preheater for sow barn	A			3.5
	Cornwall solar church monitoring; solar heated apartment project (des Barres) solar assisted DHW demonstrations; low cost monitoring system development	IMR			16.0
	Ark project	IMR	15.0	15.0	45.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar (cont'd)				
	Quebec				
	Technical and economic study of the various types of active and passive solar equipment.	CRI	23.0		
	Designing and publishing of shadow diagrams for use by architects and engineers who have to study the effects of solar radiation on the energy balance of buildings.	UM	2.0		
	Inventory of mathematical models and development of methods for assessing solar radiation, optimized for Quebec within the context of its energy use.	US		34.2	
	Development of a Cd-Cu photovoltaic solar cell.	US	49.7		
	The impact of management by micro-processors on solar heating and storage in Quebec.	US			11.4
	Measurements and studies of the thermal balance of a solar house. Development of a computer simulation program for use by architects and consulting engineers.	UL	4.0		
	Saskatchewan				
	Solar collectors for grain drying and livestock building heating	AG	11.5	13.0	
	Solar energy storage using sodium sulphate	SM;SRC	141.6	259.1	262.5
4.3	Bioenergy				
	Alberta				
	Study and potential use of waste material from wood processing plants cleaning projects and under utilized "wood" species and conduct pilot studies				

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.3	Bionergy (cont')				
	British Columbia				
	An integrated model of competing uses for wood wastes in B.C.	BCSC			30.8
	Manitoba				
	Determine biomass resource data of forests, agricultural residues, biomass energy crops, peat moss, municipal wastes (Project not activated)	EM			250.0
	New Brunswick				
	Preliminary environmental investigation of the effects of peatland development in New Brunswick	NBDE			16.5
	Trial operation of a peat-fired steam plant in Lameque, New Brunswick	NBDCD	22.5	78.2	80.0
	Installation, development and demonstration of an underfed stoker wood chip burner for residential use. Hot water and hot air systems presently operational	NBES	17.4		
	Investigation of methods of heating trout culture water using sawdust.	NBDF	1.0		
	Ontario				
	Design of an energy from waste facility	MEnv	75.0		
	Feasibility studies of institutional heating using wood chips	ME		5.0	110.0
	Feasibility and design studies on major energy from waste projects	ME		129.0	508.0
	Various projects, Biomass	ME			600.0
	Energy plantation studies	ME			125.0
	Fuel wood market research	MNR			70.0
	Prototype biomass harvesting system	MNR			130.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.3	Bionergy (cont'd)				
	Prince Edward Island Residential furnace demonstrations, economic impact analysis of a wood fuel industry, coordination of wood engineering studies	IMR	9.0	10.0	91.0
	Evaluation of public buildings for wood heat conversion	EC			10.0
	Hybrid poplar biomass production	F			10.0
	Quebec Establishment of a 3.5-MW thermoelectric plant, which uses wood residue, in Parent. Study of the plant's facilities, plans, specifications and equipment costs.	DPEN	96.0		
	Inventory of wood residue and feasibility of a 20 to 40 MW power station	DPEN	65.0		
	Saskatchewan Burning of wood waste for heat	SFPC	13.6	13.4	
	Study of potential for use of rapeseed as fuel source	AG		7.4	
	Biomass energy study	SMR;AG;SO; I&C;SPC		14.2	
	Study to develop methods for using agricultural residues as an energy source	SRC		3.5	
4.4	Wind				
	British Columbia Wind energy system trial	MEMPR BCHPA	25.0	50.0	
	Newfoundland **Use of wind mills to generate electricity for remote telephone stations in Labrador	NHE		8.2	6.2

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.4	Wind cont'd)				
	Ontario				
	Aeration of remote lakes using wind-driven air compressors	MEnv	150.0		
	Prince Edward Island				
	Atlantic Wind test site	IMR		65.0	148.0
	Wind studies: data, integration with electrical grid, non-electrical applications	IMR			4.0
	Quebec				
	Development of a windmill with two horizontal shafts, able to meet decentralized energy needs.	UL	3.0	4.0	
4.5	Geothermal				
	British Columbia				
4.5	Geothermal direct heat feasibility study for NE B.C.	MEMPR	10.0		
	Saskatchewan				
4.5	Drilling of geothermal well	SMR	30.0		

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 5: NEW LIQUID FUELS					
5.1 Direct Liquefaction					
Alberta					
	Economic and engineering studies of selected upgrading and petro-chemical processes	AOSTRA	500.0	300.0	
	Coal research program basic studies and development of coal conversion technologies	ENR			598.0
	Investigation and demonstration of viability of coal liquefaction technology in Alberta to contribute to Canada's self sufficiency in liquid fuel supply	ENR			170.0
British Columbia					
	Liquid fuels from coal by spouted-bed pyrolysis	SCBC		50.0	21.0
Nova Scotia					
	Coal liquefaction-supercritical gas extraction of liquids from coal	NSRFC	85.0		85.0
Ontario					
	Direct liquefaction of Poplar Wood	ME	22.0		
	Jack Pine pyrolysis	ME	10.0		
	Synthetic liquid fuels	ME	100.0		67.0
Saskatchewan					
	Liquid fuel production from aspen	SRC		6.0	
	Liquefaction of lignite	SRC			25.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
5.2	**Gasification**				
	Ontario				
	Wood gasifier engine (Remote Community)	ME MNA	80.0		15.0
	Wood gasification pilot plant	ME		9.4	
	Assessment of Omni fuels Hearst	ME			130.0
	Methanol from peat	MNA ME			150.0
	Prince Edward Island				
	Correctional centre wood gasifier	H&PW	135.0		
	Forestry greenhouse wood gasifier	H&PW		90.0	
	Analysis of wood gasifier/ engine/ generator	EC		5.0	
	Quebec				
	Establishment of a 2-MW gas-diesel power station, fueled in part by peat from Anticosti Island.	IREQ/US	125.0		
	Modification of a gas generator in order obtain optimum performance in converting peat into energy.	DPEN	10.0		
	Saskatchewan				
	Wood gasification study	SPC;SFPC	19.7	56.6	72.9
5.3	**Biological Processes**				
	Alberta				
	Production of fuel gas in fertilizer from dairy cattle manure	U of A	27.7		
	Ontario				
	Methane gas production including demonstration of a biogas digester	MAF	30.0	40.0	240.0
	Alcohol from Biomass Study	ME		14.6	

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
5.3	**Biological Processes (cont'd)**				
	Prince Edward Island				
	Ethanol from cull potatoes	EC			100.0
	Saskatchewan				
	Saskatchewan gasohol study	AG		39.0	
	Fermentation of wood study	SRC	24.0	26.0	
5.4	**Fuels Processing**				
	Alberta				
	Catalyst evaluation in an Industrial Claus Process test reactor	ENR		14.9	16.4
5.5	**Fuel Use**				
	Manitoba				
	Feasibility of propane fueled vehicle fleet study	MRC			32.0
	Undertake an ethanol fuel study involving a fleet of service vehicles (2 year study)	MRC			150.0
	Ontario				
	Alternate fuels for vehicle use	MTC	33.0	40.0	175.0
	Improving the output from the fuel vehicle refinery system - broadcut fuels	MTC	6.0 +		
5.6	**Hydrogen & Electrochemistry**				
	British Columbia				
	Electric power generation from fresh and sea water	SCBC			13.5
	Investigation of the integration of a commercial fuel with an electrolytic chemicals producing plant to achieve energy conservation	SCBC			80.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
5.6	Hydrogen & Electrochemistry (cont'd)				
	British Columbia (cont'd)				
	Battery research	SCBC			78.0
	Investigation of the use of intercalation systems as cathodes in reversible energy storage systems	SCBC		66.0	
	Ontario				
	Hydrogen fuel study	MTC	2.0 +		
	Hydrogen Energy Task Force	ME			100.0
	Quebec				
	Study of the possibilities of future use of hydrogen as a fuel in Quebec, and other applications.	DPEN			20.0
5.8	Planning, Coordination & Management				
	Manitoba				
	Feasibility studies gasohol use	MRC			85.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 6: CONVENTIONAL ENERGY SYSTEMS: OIL, GAS & ELECTRICITY					
6.1	**Earth Sciences**				
	Alberta				
	Consolidate, expand, improve content and accessibility of present oil, gas and oils sands basic data files, create corresponding new file for coal	ENR	364.2	496.5	200.0
	Ontario				
	Miscellaneous studies on oil and gas resource potential in Ontario	MNR-ETG	80.0		
	Saskatchewan				
	Regional stratigraphic studies	SMR	222.0	240.0	253.0
	Study of potential for natural gas reservoirs	SMR			7.0
6.4	**Enhanced Recovery**				
	Alberta				
	An effective viscosity model for flow in porous media	U of C		20.0	
	Evaluation of existing polymers for EOR and development of polymers with with superior properties	ENR		3.4	153.0
	Fundamental research related to the implementations of enhanced recovery projects in specific oil fields	ENR	440.1	480.0	1075.0
	Development and application of mathematical models and computer methods related to improved recovery of conventional crude oil, bitumen, from oil sands and coal	ENR	507.6	719.5	500.0
	Using stable isotopes for more effective utilization of gas fields in Alberta	ENR		30.0	32.0

TABLE I (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.4	**Enhanced Recovery (cont'd)**				
	Saskatchewan				
	Oil reservoir simulation study	SMR	34.6	44.4	44.5
6.8	**Electrical R & D**				
	British Columbia				
	Friedmann-Young electric field monitor	SCBC		47.4	49.0
	Integrated optic voltage sensor	SCBC			34.8
	Ontario				
	Identification of potential savings of at least 15% in commercial buildings visited (Downtown program, energy bus)	ME	150.0	70.0	100.0
	Apartment energy management strategy & electrical load management investigation	ME			20.0
	Testing of load shedding devices (ADMIC)	MHous			35.0
	Electric utility impacts of electric vehicles	MTC	1.0 +		
	Investigate potential of electric energy management strategies in multi-unit residential buildings	ME			10.0
	Prince Edward Island				
	Electrical power system modelling	DMR			3.0

TABLE II: ENERGY RESOURCE ASSESSMENT PROJECTS FUNDED BY PROVINCIAL GOVERNMENTS

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 2: OIL SANDS, HEAVY OILS, COAL SUPPLY AND COMBUSTION					
2.2	**Coal Supply**				
	Alberta Structure of the coal-bearing strata near Cadomin, Alberta	EMR	15.2	4.8	
	Nova Scotia Offshore drilling program to define the extent of the coal fields off Sydney and Mabou, Nova Scotia	NSME	6000.0	4000.0	unknown
	Onshore drilling program to define the near surface coal reserves in the Sydney basin, Springhill and Stellarton areas	NSME	1200.0	100.0	160.0
	Saskatchewan Borehole logging and coal seam data analysis	SRC	59.0	30.0	43.0

TABLE II (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 3: NUCLEAR ENERGY					
3.2 Fuel Resource Base-Fission & Fusion					
	Ontario Federal-Provincial uranium reconaissance program	MNR-GG	260.0		
	(Provincial Share) - Airborne Spectrometry lake sediment		80.0		
	Saskatchewan Uranium geochemistry	SRC	137.0	150.0	184.0
	Geology and genesis of uranium	SRC;SMDC	55.0	75.0	96.0
	Athabasca basin studies	SMR	325.0	267.0	115.0
	Testing Uranium exploration techniques	SMR		29.0	50.0
	Sub-Athabasca project	SMR			54.6
	Uranium reconnaissance program	SMR	95.5		
	Evaluation of new exploration techniques for lake-covered areas	SMR	65.5		
	Uranium metallogenic studies	SMR	53.5	72.0	60.0
	Analytical research into various radio-chemical exploration techniques	SRC			142.0
	Geology of glacial deposits	SRC	26.0	31.0	71.0

TABLE II (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 4:	**RENEWABLE ENERGY SOURCES**				
	Saskatchewan Environmental baseline monitoring and data collection	SRC		12.0	
4.2	Solar				
	Alberta Atlas of solar energy for Alberta	U of A		25.7	20.3
	British Columbia Solar resource assessment study	MEMPR	79.0		
4.3	Bioenergy				
	Ontario Biomass inventory for Ontario	MNR			80.0
	Saskatchewan Evaluation of potential renewable fuel sources on Saskatchewan farms	SRC	10.0	3.5	4.5
4.4	Wind				
	British Columbia Wind resource assessment study	MEMPR	5.0	30.0	3.3
	Nova Scotia Wind monitoring at a site suitable for a utility scale wind generator	NSME		1.3	
4.5	Geothermal				
	Alberta An investigation of geothermal energy resources of Alberta	ENR	42.7	55.9	80.0

TABLE II (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.5	Geothermal (cont'd)				
	British Columbia				
	Geothermal Resource Assessment Study	MEMPR	7.0	55.0	
	Geothermal Exploration Project Meager Creek	MEMPR BCHPA	1260.0	750.0	310.0
4.6	Peat				
	Nova Scotia				
	Provincial peat survey and sampling program	NSME			20.0
	Ontario				
	Airborne Electromagnetic Survey James Bay Lowlands to detect favourable environments for the formation of lignite deposits- follows research project carried out in 1975	MNR ETG	175.0		
	Evaluation of lignite resource potential James Bay Lowlands	MNR	255.0		
	Saskatchewan				
	Peat resource study	SMR	25.3	50.0	105.0

TABLE III: ENERGY DEMONSTRATION PROJECTS FUNDED BY PROVINCIAL GOVERNMENTS

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 1: CONSERVATION					
	Ontario				
	Unallocated funds for Conservation Projects (estimate)	ME			200.0
	Prince Edward Island				
	Estimated expenditures for various projects	IMR	100.0	100.0	
	Saskatchewan				
	Renewables/Conservation Demonstration Agreement - Conservation Projects	SMR			597.5
1.2	Industrial Sector				
	British Columbia				
	Firing a lime kiln with a Lamb Wet Cell Burner using wood waste as fuel	MEMPR		522.0	
	A technical and economic evaluation of a fluidized bed combustion demonstration unit in Vancouver using wood waste and/or municipal solid waste	MEMPR		52.0	
	Nova Scotia				
	*Waste heat utilization (tentative)	NSME			30.0
	*MW energy generation - study of potential sites	NSME			6.0
	*Installation and monitoring of a sawdust burning furnace (2 MM Btu) in a small industry	NSME		7.2	
	*Installation and monitoring of a waste wood furnace in a building components plant	NSME		4.0	

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.2	Industrial Sector (cont'd)				
	Ontario				
	Bruce AgriPark/Test Greenhouse reject available heat from nuclear station, joint venture	OEC	100.0	150.0	
	Toronto Sludge and District Heating Incineration	ME		20.0	250.0
	Saskatchewan				
	Municipal Swimming Pool Heated by Waste Heat	SGS			58.0
1.3	Agriculture & Food Sector				
	New Brunswick				
	Installation, evaluation and demonstration of an energy efficient greenhouse design.	NBDARD	2.4		
	Quebec				
	Project to demonstrate a Brace-type solar greenhouse.	DPEN			20.0
1.4	Building Sector				
	Alberta				
	Energy Efficient Housing Demonstration program to stimulate use of passive solar applications and energy conservation in residential construction and to encourage developments of technologies for economically viable design and construction. Encouragement of public awareness of energy efficient housing	ENR			300.0
	Manitoba				
	Sealing of homes against air infiltration (100 homes)	EM			16.8
	Monitoring the construction of an energy efficient bermed house	EM			2.5

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.4	Building Sector (cont'd)				
	Manitoba (cont'd)				
	Upgrade the thermal efficiency of 100 public housing units to current standards for electrically heated homes	MHRC			125.0
	"Energy Efficient Homes" in Winnipeg	EM			2.8
	Upgrade home to energy efficient levels	HUDAC			2.8
	Retrofit an older home to energy efficient standards	EM			7.1
	Develop workshop series, workbook and exhibits to promote energy efficient retrofits of existing buildings	EM			10.0
	New Brunswick				
	Design, construction and demonstration of a three bedroom prefabricated house using a ground water source heat pump and exhaust air heat exchanger	NBEPC	33.0	8.0	5.0
	To design, construct and monitor an energy efficient office building based upon a ground water heat pump, preserved wood foundation and high insulation levels	NBEPC	175.0	5.0	
	Newfoundland				
	**Energy Audit Program	NHE		1.3	4.7
	**Energy Efficient Housing Demonstration Project	NHE			25.0
	**Retrofit Program Including Houses and Other Buildings	NHE			39.0
	**Retrofit of Aquarena to Reduce Energy Consumption	NHE			40.5
	Northwest Territories				
	Demonstration buildings for the Keewatin District in the 1980 (estimated expenditures)	HC			560.0

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.4	Building Sector (cont'd)				
	Nova Scotia				
	*Development of a window insulating mechanism	NSME			1.2
	*To create a heat sink/source to increase the efficiency of a new heating system	NSME			4.0
	*The construction of ten energy efficient homes	NSME			34.6
	Energy audits are carried out in commercial and institutional buildings in Nova Scotia	NSME	516.0	475.0	475.0
	Ontario				
	Demonstrate novel energy conservation methods for existing single and multiple unit residential construction and overcome technical impediments	ME	100.0		65.0
	Design analysis and demonstration of energy conserving and solar assisted heat pump system for a school	MEd	220.0		
	City Street lighting Demonstration Project	MTC	25.0		
	Demonstration of energy conservation opportunities in urban redevelopment	ME		20.0	100.0
	Demonstration of energy conservation opportunities in large scale commercal/ residential developments	ME		20.0	60.0
	Feasibility of central heating systems; innovative heat supply options, demonstration of cost effective, energy conserving design	ME	80.0		
	Demonstration of district heating in residential communities	ME		84.5	50.0

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.4	**Building Sector (cont'd)**				
	Prince Edward Island				
	Low-cost, energy efficient housing demonstration	IMR			11.0
	Saskatchewan				
	Construction and demonstration of Saskatchewan Conservation House	SMR, SHC, SRC	158.0	56.0	14.0
	Housing Retrofit Demonstration	SMR, SHC		80.4	177.5
	Energy Conserving Housing Demonstration	SMR, SHC		77.0	214.0
	Construction of Energy Conserving Classrooms	Educ.	129.6	4.0	4.2
	Energy conserving hostel	DNS		5.0	15.8
1.5	**Transportation Sector**				
	Manitoba				
	Demonstrate the viability of vanpooling in Manitoba (Project only approved in 1982)	Trans			15.0
	Nova Scotia				
	*The assessment of maintenance measures on automotive fuel economy	NSME			10.0
	Ontario				
	MTC car pool demonstration	MTC	25.0 +		
1.8	**Planning, Coordination and Management**				
	Nova Scotia				
	*A study to determine appropriate methods and levels of monitoring for demonstration projects	NSME		1.4	

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 2:	**OIL SANDS, HEAVY OILS, COAL SUPPLY AND COMBUSTION**				
2.1	Oil Sands and Heavy Oils				
	Alberta				
	Construction and operation of a pilot plant to test the Taciuk Thermal Processor	AOSTRA	500.0	500.0	500.0
	Construction and operation of a pilot plant at the Shell Peace River site for in-situ recovery of bitumen using a steam flood process	AOSTRA	18200.0	22100.0	6000.0
	Construction and operation of a pilot plant at the Amoco Canada site at Fort McMurray to test an in-situ bitumen recovery process using a combination of forward combustion and water	AOSTRA	3300.0	3400.0	4500.0
	Construction and operation of a pilot plant at the BP Exploration site at Cold Lake for in-situ recovery using a fire-flood process	AOSTRA	1600.0	1000.0	1000.0
	Saskatchewan				
	North Battleford heavy oil recovery project	SO	395.0	641.7	548.3
	Canada - Saskatchewan Heavy Oil Agreement to fund thermal recovery demonstration projects	SHR	1014.1	2849.1	1281.6

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 4:	RENEWABLE ENERGY SOURCES				
	Manitoba Renewable Resources R&D projects (Canada/Manitoba Bilateral Energy Agreement)	EM			350.0
	Ontario Unallocated funds for Renewable Energy Projects (estimate)	ME			1000.0
	Saskatchewan Renewables/Conservation Demonstration Agreement Renewables Projects	SMR			597.5
4.1	Hydraulics				
	British Columbia Glacier Park Small hydro	MEMPR			50.0
	Nimmo Bay Micro Hydro	MEMPR			6.0
	Hoeya Hilton Micro Hydro	MEMPR			7.0
	Nova Scotia *To determine the feasibility of using excess water in some municipal watersheds for small hydroelectric development	NSME			7.6
	The demonstration of tidal power generation on the Annapolis River	TPC			7000.0
	Study of the feasibility of reclaiming an abandoned small hydro site on the Bloody Creek	NSME		12.5	
	Prince Edward Island Low Head Hydro Demonstration	IMR			6.0

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar				
	British Columbia				
	Solar Domestic Hot Water Demonstration Project	MEMPR	3.0	100.0	50.0
	Penticton Art Gallery Solar	MEMPR			3.0
	Solar Hot Water, Port Alberni Care Home	MEMPR			40.0
	U. Vic McKinnon Building Solar	MEMPR			67.5
	Manitoba				
	Single family residence featuring bermed construction, wood basement, super-insulated walls & passive solar heating	EM			5.0
	Swimming pool heated solely by an active solar energy system	EM			23.0
	Active solar system to heat pool water	EM			1.1
	Newfoundland				
	**Trombe Wall Installation at Guide/Scout Camp	NME			0.6
	Nova Scotia				
	*To warm a hog barn and assist crop drying with site-constructed solar panels	NSME		1.7	
	*Solar DHW in a new transit facility in Dartmouth	NSME			7.0
	*Solar DHW installation and monitoring in a 12-unit apartment building	NSME		6.0	
	*The design, construction and testing of a solar DHW kit	NSME			1.6

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar (cont'd)				
	Nova Scotia (cont'd)				
	*Solar heating demonstration of a municipal swimming pool	NSME			15.0
	*The demonstration of a solar assisted heat pump system for a farrowing barn	NSME			4.4
	Ontario				
	Solar energy for Farm use including demonstration of solar heating of livestock buildings	MAF	30.0	60.0	110.0
	Design and installation of a 900 square foot solar water preheating system in a collegiate	MEd	5.0		
	Design and construction of solar hot water and swimming pool system for a large school	MEd	150.0		
	Selection of site for demonstration of solar heating for an existing municipal swimming pool and commencement of construction	ME	50.0		
	Preparation of builder's guide to energy-conserving housing and solar heating via passive design and solar water heaters	ME	100.0		
	Cost sharing the funding of solar projects proposed by private-sector builders	ME	50.0		
	Monitoring, performance assessment, and reporting on public and private sector projects	ME	100.0		
	Development of Ontario test facility for solar domestic water units to assist manufacturers in developing reliable cost effective products and to provide data for use by CSA in standard formulations	ME	100.0		

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar (cont'd)				
	Ontario (cont'd)				
	Development of an analytical tool to permit prediction of the penetration of solar technology into the residential hot water and space heating market	ME	100.0		
	Report on the performance and economics of passive solar systems under Ontario conditions	ME	25.0		
	Feasibility study for the application of solar energy utilization to domestic hot water heating systems in institutional buildings	MGS	80.0		
	Designing of solar water preheating system for retrofit of Oakville General Hospital	ME	70.0		
	Demonstration of four solar domestic hot water preheat systems in retrofit situation	MH-RD	5.0		
	Design and installation of solar domestic water preheating system for retrofit to a high-rise apartment building	MH-RD	160.0		
	Assessment of monitoring data from Aylmer Senior citizens project	MH-RD	5.0		
	Design of hot water system for new senior citizens residence	MH-RD	30.0		
	Solar hot water (Hotel/Motel)	ME	100.0		
	Solar hot water (Park/Carpark Stations)	ME	30.0		
	Solar hot water retrofit (Campus Res.)	ME	80.0		
	Design, demonstration and monitoring of solar energy systems in the residential sector for specific sites	ME MHous		29.5 24.0	214.0

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar (cont'd)				
	Ontario (cont'd)				
	Design, installation, commissioning and monitoring of solar energy systems of service hot water in the commercial sector	ME MHth MCS MGS MNA		25.0 10.0 17.0 75.0 80.0	
	Assessment (and modification, if necessary) of solar demonstration commissioned in 1978/1979	MEd ME		15.0 29.8	
	Quebec				
	Preliminary architectural plans and specifications for an active an a passive solar system integrated into the design of a reception centre.	DPEN	5.0		
	Thermal balance, plans and specifications for a solar system and related equipment for a hospital laundry room.	DPEN	2.0		
	Designs, plans, specifications and construction of three models of factory built houses which use passive solar solar heating.	DPEN		50.0	
	Study of energy recovery and use of a solar system to heat water. Preliminary draft, plans and specifications for the solar system.	DPEN	4.0		
	Plans, specifications and installation of an active solar energy heating system for the Kinsmen house 1978.	DPEN	23.5		
	Plans and specifications for the study of a solar energy heating system which fulfills the needs of an observatory.	DPEN	2.8		
	Use of solar collectors and interseasonal storage in water for self-sufficient heating of a single-family dwelling.	INRS-E	121.0		

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.2	Solar (cont'd)				
	Quebec (cont'd)				
	Installation of solar collectors and related system to heat the domestic water supply for 23 units of a building.	DPEN	2.0	20.0	
	Design and installations of an air collector suited to the Quebec climate and able to meet the real energy needs of a building.	UM	14.0		
	Preliminary draft, plans and specifications for a system system and related equipment for a new school.	DPEN		10.0	
	Design, plans and specifications for a solar energy heating system integrated into the renovation of a multi-unit building.	DPEN	11.0	20.0	
	Design, plans and specifications for a solar energy heating system to meet the needs of a reception centre.	DPEN			38.5
	Plans and specifications for a system to provide domestic hot water, heated by means of solar energy, for two schools.	DPEN			3.0
	Saskatchewan				
	Pool heated by solar energy	C&Y	12.0	5.0	
4.3	Bioenergy				
	Newfoundland				
	**Burning Wood Waste to Heat Gander Hospital	NHE		47.9	19.6
	**Peat Fired Boiler for Pulp and Paper Mill in Grand Falls	NHE		28.1	91.9

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.3	Bioenergy (Cont'd)				
	Nova Scotia				
	Wood supply evaluation, preliminary design and economic evaluation of a 350,000 pph to 500,000 pph wood fired boiler system at Point Tupper, Nova Scotia	NSME	200.0		
	Implementation of a pilot woodburning (sawmill residues) plant; producing 50,000 pph steam at Gordon's Greenhouse Ltd., Oxford, Nova Scotia	NSME	260.0	130.0	10.0
	*The construction and demonstration of a straw burning boiler at a greenhouse- other agricultural wastes will be tested as fuels	NSME		6.0	15.0
	*Chipped wood heating of a poultry house	NSME			8.0
	Prince Edward Island				
	O'Leary Regional Services centre wood pellet fuel demonstration	H&PW			6.0
	Old Court House wood pellet demonstration	H&PW			5.0
	Eastern Kings Memorial Hospital wood chip fuel demonstration	EC			3.0
	Quebec				
	Specific evaluation of the forest resources available for energy purposes in the immediate vicinity of Sherbrooke, and assessment of the type of wood furnace that is most suitable for the university heating plant.	US	50.0		
4.4	Wind				
	British Columbia				
	Windmill Demonstration Project	MEMPR	1.0	8.0	2.5

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.4	Wind (cont'd)				
	New Brunswick Purchase, installation and demonstration of 2000 Watt Dunlite wind generator at Shediac district office	NBEPC	8.5	2.2	
	Nova Scotia Demonstration of the use of a 200 kw wind generator to provide pumped storage for the Wreck Cove hydro project	NSPC	17.0	300.0	283.0
	Ontario Wind/Diesel Hybrid (Remote Community)	ME MNA	140.0	26.5	298.0
	Prince Edward Island Windmill demonstration-St. Eleanors School	H&PW	81.0		
	Quebec Purchase of a 4-kW horizontal-shaft windmill and a system of electrical energy accumulators to provide lightning for a park.	UL		45.0	
	Design and purchase of a Darrius windmill able to produce 10 to 20 kW of power for lightning Dubuc Bridge in Chicoutimi.	DPEN			47.0

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 5: NEW LIQUID FUELS					
5.3 Biological Processes					
	Quebec Establishment of a methanol-producing plant financed by the Forests Branch. Analysis of conditions for setting up the plant, for producing and selling methanol.	DPEN			
5.4 Fuels Processing					
	Alberta Construct pilot plant and field test feasibility of helium recovery from lean Alberta natural gas using cellulose acetate and other membranes	ENR	1241.2	479.0	550.7
5.5 Fuel Use					
	Manitoba Conversion of 25 light duty service vehicles to Propane operation	MTS:MRC			55.5
	Conversion of 25 light duty vehicles to gashol operation.	MTS:MRC			64.7

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 6: CONVENTIONAL ENERGY SYSTEMS: OIL, GAS AND ELECTRICITY					
6.6	**Transportation of Oil and Gas**				
	Ontario				
	Polar gas project-feasibility of transporting natural gas from Arctic available Islands by pipeline, joint-venture	OEC	1300.0	1900.0	unknown
6.8	**Electrical R&D**				
	Nova Scotia				
	*To control a large building's electrical peak demand by wire transmitted radio signals	NSME			3.7
	*To reduce peak electrical loads loads by the use of hot water storage units	NSME		5.0	5.0

TABLE III (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 7: OVERALL COORDINATION					
	Nova Scotia				
	*A study to correlate the capabilities of alternate energy technologies with sectoral energy demands in Nova Scotia	NSME			2.8

* Funded under the DREE/NS Energy Opportunities Subagreement - Provincial dollars only are reported for these items and equal to 20% of the total expenditures for the years.

** Funded under the Canada/Newfoundland Federal/Provincial Agreement on Demonstration of Conservation and Renewable Technologies - Provincial dollars only are reported for these items and equal to 20% of the total expenditures for the years.

TABLE IV: ENERGY R&D PROJECTS FUNDED BY PROVINCIAL UTILITIES

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 1: CONSERVATION					
1.0	General Topics				
	British Columbia				
	Studies for energy use department	BCH			16.2
	Quebec				
	Miscellaneous projects	IRHQ			299.6
1.2	Industrial Sector				
	Quebec				
	Thermal studies	IRHQ			318.1
	Saskatchewan				
	Greenhouse heating from waste heat - gas turbine exhaust and thermal plant flue gas	SPC	14.9	0.9	
	Waste heat utilization - greenhouse, fish farming, district heating feasibility studies	SPC	3.0	13.6	14.1
	Municipal solid waste gasification	SPC	1.7		
1.4	Building Sector				
	New Brunswick				
	Monitoring of residential space heating requirements	NBEPC		3.0	
	Monitoring of domestic hot water requirements	NBEPC		0.5	
	Saskatchewan				
	Evaluation of energy conservation measures for commercial buildings	SPC	10.0	19.3	10.8
	Testing and evaluation of various types of electric heaters in company housing	SPC	36.5	13.9	11.8
	Evaluation of energy consumed by an earth-sheltered equipment enclosure	Sask Tel	0.5	5.2	11.3

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
1.4	Building Sector (cont'd)				
	Saskatchewan (cont'd)				
	Comparison of residential (rural) oil furnace vs. electric furnace efficiences	SPC	7.5	24.7	6.3
	Off-peak heating - electric heat storage furnace	SPC	28.3	32.6	15.0
	Adaptive control - off-peak furnace	SPC	16.5		
1.5	Transportation Sector				
	Saskatchewan				
	Evaluation of thermostatic controls and timers for automobile block heaters	SPC		2.2	6.8
1.6	Demand				
	Ontario				
	Energy Conservation and Utilization (electric cars)	OH	811.0	829.0	1173.0
	Saskatchewan				
	Testing and evaluation of energy conservation equipment and appliances for domestic applications	SPC	1.0	9.5	6.4

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 2: OIL SANDS, AND HEAVY OILS; COAL SUPPLY & COMBUSTION					
2.3	Coal Combustion				
	British Columbia				
	Investigation of effectiveness of combustion improving additives in fuels	BCH	8.4		
	Consultation, HPFB combustion etc.	BCH		9.2	
	Pressurized fluidized-bed combustion	BCH	230.0	80.0	
	Saskatchewan				
	Boiler slag reduction	SPC	0.5		
	Identification and control of turbine - generation units	SPC		6.1	18.2
	Power Plant efficiency	SPC		6.1	18.5
2.4	Environment				
	Saskatchewan				
	Trace elements in coal and water	SPC	1.7	11.5	18.9

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 3: NUCLEAR ENERGY					
3.1	**Regulatory Support-Fission & Fusion**				
	Saskatchewan				
	Nuclear power investigation	SPC	2.1	3.9	8.0
3.3	**Utilization and Support-Fission & Fusion**				
	Ontario				
	Heavy water separation	OH	559.0	644.0	523.0
	Nuclear reactor technology	OH	2551.0	4068.0	7133.0
	Nuclear waste management	OH	113.0	373.0	790.0
3.4	**Nuclear Fusion - Basic Research**				
	British Columbia				
	UBC laser fusion research	BCH			50.0
	Quebec				
	Thermonuclear fusion	IRHQ			1170.6

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 4: RENEWABLE ENERGY SOURCES					
	Saskatchewan				
	Unconventional energy utilization	SPC	30.8	24.8	18.3
4.1	Hydraulics				
	British Columbia				
	Development and application of instrumentation for wind, ice or other loading of transmission structures. Metallurgical studies including fracture toughness related to quality control of materials or components being supplied for major construction projects	BHC	31.7		
	Investigation of commercial preblended concrete materials	BHC	4.6		
	Instrumentation development and applications related to performance of electrical equipment and turbines. Failure analysis, weldability, fatigue and residual stress studies related to turbines	BCH	18.7		
	Test soils, aggregates and concrete and make recommendations as to their suitability and methods of use. Field investigations of rock, soil or concrete condition.	BCH		86.6	
	Investigation of new technologies and materials of concrete including roller compact use of additives & admixtures etc.				
	Rock anchors research	BCH			19.3
	System mechanical research	BCH			93.0
	Tunnel pressure research	BCH			16.2

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.1	Hydraulics (cont'd)				
	British Columbia (cont'd)				
	Investigations of new techniques and materials and equipment for the production, placement and testing of concrete and cement based materials	BCH			50.0
	Saskatchewan				
	Small hydro assessment	SPC	4.7	19.0	14.3
4.2	Solar				
	British Columbia				
	Chemical engineering projects	BCH		37.6	
	Photovoltaic demonstration program	BCH			21.5
	Solar energy investigations	BCH			66.1
	New Brunswick				
	Monitoring of a commercial office building utilizing solar energy assist-heat pump system	NBEPC	20.0		
	To provide for the capital cost and monitoring of an active solar-heated warehouse complex	NBEPC	12.0		
	Quebec				
	Solar energy research	IRHQ			225.6
	Saskatchewan				
	Evaluation of solar heating system on the Saskatchewan Conservation House	SPC	2.0		
	Assessment of direct solar/electric energy conservation techniques	SPC	1.5	2.1	5.6

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
4.3	**Bioenergy**				
	Quebec				
	Biomass	IRHQ			318.1
	Saskatchewan				
	Wood furnace evaluation	SPC	0.4	1.9	2.4
4.4	**Wind**				
	British Columbia				
	Christopher Point wind generator	BCH		45.6	34.6
	Wind instrumentation at Worlcombe Island analysis of benefits of continuing with record-taking	BCH	2.6		
	Quebec				
	Windmills	IRHQ			1204.0
	Saskatchewan				
	Wind power	SPC	56.0	16.0	4.7
	Evaluation of wind turbine as power source for remote installations	Sask Tel	4.5	17.0	10.5
4.5	**Geothermal**				
	British Columbia				
	Meager Creek geothermal	BCH	322.8	325.8	1372.5
4.6	**Peat**				
	Saskatchewan				
	Lignite dewatering	SPC	7.0	6.0	2.6

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 5: NEW LIQUID FUELS					
5.1	**Direct Liquefaction**				
	Saskatchewan Coal reactivity	SPC	6.9	20.7	
5.2	**Gasification**				
	Saskatchewan Small coal gasifier application	SPC	31.1	22.5	
5.6	**Hydrogen and Electrochemistry**				
	Quebec Applications of electrochemistry	IRHQ			1079.8
	Saskatchewan Hydrogen generation using novel hydrolysis techniques	SPC	0.8	3.9	5.0
	Advanced generation techniques using Shaunavon coal	SPC	104.5	90.7	34.7

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
TASK 6: CONVENTIONAL ENERGY SYSTEMS: OIL, GAS AND ELECTRICITY					
6.5 Materials					
	British Columbia				
	Underground storage tanks	BCH	12.0		
	Instrumentation applications and metallurgical studies related to pipelines	BCH	4.5		
	Evaluation of mechanical properties of gas pipe both plastic and steel, evaluation of pipe protection systems	BCH		4.7	
	Conduct metallurgical studies on pipe steels, production and test welds and aid in the evaluation of welding procedures	BCH			6.7
	Pipeline studies	BCH			35.3
6.6 Transportation of Oil and Gas					
	Saskatchewan				
	Automatic alarm for natural gas town border stations	SPC	25.1	37.2	16.1
	Natural gas odorant level measuring	SPC	10.6	9.2	22.9
	Natural gas system programs	SPC	6.0	3.2	6.1
	Icing problems in natural gas town border stations	SPC	0.1	0.3	
	Remote location (natural gas town border stations) signal transfer	SPC		1.8	5.4
	Heater control in natural gas town border stations	SPC	0.2	4.3	11.3
	Effect of odorants on gas cavern installations	SPC		3.3	10.0

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	**Electrical R&D**				
	British Columbia				
	Investigation of various grounding problems	BCH	4.9	49.6	
	Insulation problems	BCH	11.7		
	Acoustic emission techniques for internal discharge location	BCH	4.7		
	Upgrading of 13 kV XLPE cable to 25 kV	BCH	22.5	39.4	
	Flashing light for crossing towers, supplied by semicon insulators (in conjunction with Dr. Moore, UBC)	BCH	11.6		
	Strength of material tests, proof loads, evaluation and stress analysis for transmission line hardware, distribution materials, tools, construction materials etc.	BCH	45.6		
	Investigate methods of transformer transportation	BCH	5.3		
	Development of suitable method of determining reliability of plastic service duct	BCH	14.6		
	Mechanical research for others	BCH	16.7		
	Develop new and improved techniques for mechanical test and analysis	BCH	12.6		
	Equipment maintenance and modifications including laboratory instrumentation and computer applications	BCH	24.2		
	Underground plastic duct for electrical power distribution	BCH	10.0		

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	British Columbia (cont'd)				
	Investigation of new techniques and materials	BCH	43.3		
	Metallurgical investigations of causes of failure. Make recommendations for remedial action including repair and quality control procedures	BCH	51.8		
	Investigate and evaluate materials and hardware for materials standards	BCH	4.3		
	Evaluate prototype equipment and hardware for Engineering Group, recommend remedial action on materials, processing and/or designs	BCH	6.9		
	Investigation of PCB removal by fullers earth	BCH	6.0		
	Wood preservative analysis	BCH	18.7		
	Research work for the Materials Engineering section and others	BCH	10.0		
	Miscellaneous non-routine projects pertaining to lubricants, fuels, insulating oils and gases, etc.	BCH	40.4		
	Distribution transformer protective coatings investigation (including addition retest work)	BCH	6.1		
	Investigation of the use of powder coatings	BCH	34.0		

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	British Columbia (cont'd)				
	Protective coatings projects initiated by Research & Development (including underwater coatings research and special materials)	BCH	4.5	11.6	23.9
	Pipelines on rights-of-way or near stations - investigation of problems	BCH	6.4		
	Problems of radio noise and televisions interference from transmission lines	BCH	21.4		
	Studies of effects of electric fields around transmission lines	BCH	4.6		
	Determination of ways of mitigating effects of transient overvoltages on substation equipment and on laboratory equipment	BCH	11.1		
	HVDC System—testing of stage V, and studies of effects of sea return current	BCH	11.8		
	Failure analysis of safety related items and evaluation of quality of new products for Safety Engineering. Items such as hotline clamps, safety equipment, and any hardware which has caused injury to personnel are frequently evaluated.	BCH		3.0	
	Audible noise investigations at stations and transmission lines	BCH		46.0	
	Investigation of series capacitor station problems	BCH		16.0	
	Transmission line interference studies-significance of strengh of local signals 500 kV TVI	BCH		26.2	

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	British Columbia (cont'd)				
	Studies of effects of transmission line electric fields	BCH		18.6	
	Investigation of induced transient over-voltages in low voltage circuits	BCH		56.5	
	Pipeline investigations	BCH		20.8	
	Investigation of transmission system problems	BCH		105.7	
	Acoustic emission techniques	BCH		6.2	
	Corona preventive coatings	BCH		5.9	
	Distribution cable accessory evaluation	BCH		20.4	
	Gaseous products from transmission oils	BCH		16.1	
	Aircraft warning lights for transmission line crossings	BCH		6.6	
	Research SF6	BCH		12.0	10.0
	Mechanical tests on hardware, proof tests on structural members or tower sections. Development and production of load monitoring systems	BCH		99.9	
	Assessment of prototype hardware and service damage for transmission lines and various assignments on the major construction projects.	BCH		4.0	
	Non destructive testing of new gas lines, regulator station piping, etc.	BCH		6.7	
	Detection of cellulose degradation products in oil by high-pressure liquid chromatography	BCH		4.4	6.2

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	British Columbia (cont'd)				
	Measurement of corona by-products in SF6	BCH		8.4	
	Corona by-products in insulating oil	BCH		1.5	
	PCB fragmentation analysis	BCH		5.8	
	Specific requests to investigate characteristics of materials, corrosion, pollution, etc. and to recommend appropriate remedial action	BCH	80.7	99.9	151.1
	Wood preservative analysis	BCH		33.3	38.1
	Specific investigative projects pertaining to lubricants fuels, insulating oils and gases, etc.	BCH		59.8	77.2
	Evaluation of alkyd paints and catalysed automotive paints for underground electrical distribution equipment	BCH		14.5	
	Development of testing methods for plastic products, testing of miscellaneous hardware of a variety of materials	BCH		44.0	
	Development and manufacture of testing equipment. Developing test methods	BCH		39.1	
	Failure analyses and product evaluation	BCH		55.8	
	Conduct metallurgical studies on pipe steels, production and test welds	BCH		9.5	
	Failure analyses on load bearing and current carrying structures, above and below ground.	BCH		15.7	

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	British Columbia (cont'd)				
	Examine underground storage tanks for leaks, assistance to various generating stations on maintenance of items such as water piping, turbine runners, etc.	BCH		18.1	
	NDT for other sections of Research and Development	BCH		30.9	
	Field evaluation of concrete weathering. Design of repair materials for concrete, etc.	BCH		1.2	
	Work for purchasing - primarily precast concrete items	BCH		2.0	
	Cross-linked polyethylene analysis	BCH			31.7
	Internal research assignments	BCH			27.0
	Investigation of two coat systems for Hydro-electric equipment	BCH			6.2
	Measurement of SF6 breakdown products	BCH			8.4
	Development of quality evaluation tests for generator stator insulation systems	BCH			92.4
	High voltage machine insulation studies	BCH			15.0
	Investigations into corona preventive paints (grading paints and semi-conductive paints)	BCH			13.1
	Partial discharge diagnostic techniques (acoustic emission, PRA, Tan)	BHC			15.4

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	British Columbia (cont'd)				
	15 kV XLPE cable on 25 kV systems	BCH			43.1
	Electrical tests of splices	BCH			10.2
	Interfacial breakdown in insulation systems	BCH			26.2
	Electrohydrodynamic effects in transformer oil	BCH			17.7
	Interference from transmission lines	BCH			36.2
	Effect of transmission line fields	BCH			23.8
	Induced transients in control circuits	BCH			70.6
	Special grounding investigations	BCH			89.2
	System problems and development of instrumentation	BCH			115.0
	High line data acquisition research	BCH			1.4
	Sheave efficiency research	BCH			27.0
	Cable tension research	BCH			11.2
	Misc. mechanical testing research	BCH			28.6
	Bus support insulator research	BCH			4.2
	Pencil pile studies	BCH			10.8
	Conduct failure analyses and product evaluation on various structural components	BCH			55.7

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	British Columbia (cont'd)				
	Conduct failure analyses on both load bearing and current carrying structures, above and below ground and rate acceptability on various tool hardware related to the operations group.	BCH			15.2
	Assist others in the evaluation of P.E. cable and secondary connections and provide scanning electron microscope services to outside organizations.	BCH			4.0
	Perform failure analysis of safety related items in conjunction with Safety Engineering including hotline clamps, safety equipment and hardware which has caused injury to personnel.	BCH			9.3
	Purchase/testing of small static inverter and protection equipment to gain a better understanding of interfacing, safety and protection requirements.	BCH		3.0	2.0
	Ontario				
	Transmission, distribution and stations	OH	3563.0	2913.0	3180.0
	Thermal plant	OH	2548.0	3181.0	3652.0
	Soils, concrete, masonry and building materials	OH	2634.0	2581.0	3299.0
	Electrical apparatus and system performance	OH	1802.0	2052.0	2400.0
	Environmental, air	OH	1784.0	1470.0	1448.0
	Environmental, water	OH	1886.0	2001.0	2195.0

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	Quebec				
	Miscellaneous projects	IRHQ			857.0
	Apparatus behavior	IRHQ			374.8
	Synthetic test techniques	IRHQ			592.8
	Network phenomena affecting apparatus	IRHQ			116.1
	Distribution	IRHQ			443.8
	Electric arcs	IRHQ			585.9
	Study of the corona effect	IRHQ			434.7
	External insulation	IRHQ			372.1
	Pollution	IRHQ			328.4
	Internal insulation	IRHQ			431.4
	Measurement techniques	IRHQ			215.6
	Physics of high volume discharges	IRHQ			1120.7
	Overhead conductor vibration	IRHQ			684.4
	Mechanical tests	IRHQ			413.5
	Metallurgy	IRHQ			876.7
	Electrical insulators	IRHQ			808.0
	Physical & organic chemistry	IRHQ			953.1
	Production systems planning	IRHQ			979.1

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	Quebec (cont'd)				
	Direct current & the simulator	IRHQ			411.7
	Numerical method of network analysis	IRHQ			884.9
	Studies on AC systems & the TNA	IRHQ			813.4
	Information transmission	IRHQ			578.0
	Electronic measuring systems	IRHQ			287.4
	Automatic controls & protection	IRHQ			851.5
	Real-time systems & data processing	IRHQ			305.5
	Saskatchewan				
	Prairie electrical grid study	SMR	45.0	5.0	
	Universal clock timer for residential load management	SPC	2.3	1.7	
	Aluminium wiring evaluation	SPC	2.1	4.6	12.5
	Power plant modeling	SPC	1.3	7.5	10.9
	Dynamic simulation package development	SPC	0.7	2.9	1.8
	Intelligent remote units for automatic generation control	SPC	0.9	9.1	19.7
	Rural distribution of electricity	SPC	21.1	21.6	21.0
	Tower stress analysis	SPC	0.4	0.9	2.7
	Steel tower vibration studies	SPC	6.7	11.4	8.3
	Test line conductor studies	SPC	18.3	19.4	18.2
	Development of vibration data analysis equipment	SPC	20.3	23.2	10.8

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	Saskatchewan (cont'd)				
	Vibration damper evaluation	SPC	15.6	12.8	17.1
	Line inspection via videotape	SPC	0.6	1.7	
	Fibre optics to transfer signals from transmission lines	SPC	0.2	0.4	
	Switchyard event and data communication	SPC	5.1	9.3	12.8
	Voltage flicker meter	SPC	0.3		
	Rotational speed control	SPC	32.6	25.6	12.3
	Current and voltage transducer	SPC	8.1	10.0	21.1
	System time base	SPC	2.1	3.9	
	System simulation	SPC	0.2		
	Load identification	SPC	0.7	4.2	8.5
	System protection	SPC	5.4	3.0	
	Switching station automation	SPC	47.8	67.6	74.9
	Line/Tower insulation co-ordination	SPC	6.4	3.4	3.5
	Automatic meter reading	SPC	0.8	10.6	24.4
	Rural lightning protection	SPC	3.4	10.8	20.2
	Transmission disturbance record	SPC	3.2	16.3	19.6
	Ferroresonance control device for distribution transformers	SPC		8.3	24.8
	Distribution system maintenance data base	SPC		5.1	15.4

TABLE IV (Cont'd)

R&D Area	Project Title	Department or Agency	Estimated Expenditure ($000) 1978-9	1979-80	1980-81
6.8	Electrical R&D (cont'd)				
	Saskatchewan (cont'd)				
	Distribution system automation	SPC		2.3	6.8
	Development of tester to determine capability to withstand electric surge	SPC		1.8	5.5
	University research grants for power system and other studies	SPC	24.6	32.7	26.3
	Joint research projects with Canadian Electrical Association and others	SPC	77.5	93.4	82.5
	Storm tracking	SPC	3.2	20.8	12.8

APPENDIX A

List of Provincial and Territorial Agencies and Reporting Officers

Provincial Agencies and Reporting Officers

Provincial Agency	Acronym	Reporting Officer	Telephone
ALBERTA			
1 Alberta Energy and Natural Resources	ENR	J.K. Kleta	(403)427-2983
2 Alberta Oil Sands and Technology Research Authority	AOSTRA	Doug McDonald	
BRITISH COLUMBIA			
1 B.C. Ministry of Energy, Mines and Petroleum Resources	MEMPR	J. Hill	(604)689-1831
2 B.C. Energy Commission	BCEC	J. Hill	(604)689-1831
3 B.C. Energy Development Agency	EDA	B. Stevenson	(604)387-3690
4 Science Council of B.C.	SCBC	P. Ngshun	(604)273-0788
5 BC Hydro	BCH		
- Fossil Fuels		R.M. Woodley	(604)663-2721
- Conservation & Renewables		T. Newton	(604)663-3583
- Research & Development		H.M. Ellis	(604)591-0200
MANITOBA			
1 Manitoba Research Council	MRC	J.K. Reichert	(204)994-2032
2 Manitoba Department of Energy & Mines	EM	W.V. Bowerman	(204)944-3417
3 Manitoba Housing & Renewal Corporation	MHRC	A.J. Shade	(204)944-4687
4 Highway Transportation Department	Trans	J. Rea	(204)944-2005
5 Housing & Urban Development Advisory Committee	HUDAC		
6 Manitoba Telephone System	MTS	J. Blonquist	(204)477-6716
NEW BRUNSWICK			
1 Energy Secretariat	NBES	Dan Clarke	(506)453-3684
2 Department of the Environment	NBDE	J. Williamson	
3 Department of Agriculture and Rural Development	NBDARD	Maurice Robichaud	
4 Department of Commerce and Development	NBDCD		
5 Department of Fisheries	NBDF		
6 New Brunswick Electric Power Commission	NBEPC		
NEWFOUNDLAND			
1 Newfoundland Department of Mines & Energy	NME	C. Dicks P. Graham Bob Vardy	(709)737-2411
NORTHWEST TERRITORIES			
1 Department of Renewable Resources		J. Severn Ron Hawkins	(403)873-7207
2 Northwest Territories Housing Corp.	HC	C. Jalkolzy	

Provincial Agencies and Reporting Officers

Provincial Agency	Acronym	Reporting Officer	Telephone
NOVA SCOTIA			
1 Department of Mines and Energy	NSME	Vaughn Munroe	(902)424-3203
		P.C. Ryan	(902)424-8944
2 Department of Public Works	NSPW	M. Zareski	(902)678-2774
3 Nova Scotia Tidal Power Corporation	TPC	G. Baker	(902)424-6230
4 Nova Scotia Power Corporation	NSPC	B.B. MacDonald	(902)424-8670
5 Nova Scotia Research Foundation Corp.	NSRFC	F. Brothers	(902)539-5300
6 College of Cape Breton	CCB	J. Strasser	(902)895-1571
7 Nova Scotia Agricultural College	NSAC	L.M. Cook	
ONTARIO			
1 Ontario Energy Corporation	OEC	Wayne Brush	(416)965-6276
2 Ministry of Agriculture and Food	MAF		
3 Ministry of Consumer and Commercial Relations	MCCR		
4 Ministry of Education	MEd		
5 Ministry of Energy	ME	D. MacAlpine	(416)965-5174
6 Ministry of the Environment	MEnv	Bruce MacOdrum	
7 Ministry of Government Services	MGS		
8 Ministry of Housing	MHous		
9 Ministry of Housing - North Pickering Development Corporation	MH-NPDC		
10 - Project Planning & Evaluation	MH-PE		
- Research & Development	MH-RD		
11	MNA		
12 Ministry of Northern Affairs			
13 Ministry of Natural Resources	MNR-ETG		
- Engineering & Terrain Geology	MNR-GG		
14 - Geophysics, Geochemistry Section			
15 Ministry of Transportation and Communications	MTC		(416)231-4111
16 Ontario Hydro	OH	F. Kee	(416)822-4111
17 Ontario Research Foundation	ORF	A.S. Deshpande	
PRINCE EDWARD ISLAND			
1 Department of Agriculture & Forestry	A	A.W. Humphrey	(902)892-4101
2 Energy Corporation	EC	A.J. Hiscock	(902)892-1051
3 Housing Corporation	HC	D. Turner	(902)892-0221
4 Institute of Man & Resources	IMR	M. Musgrove	(902)892-0361
		C.K. Brown	
5 Department of Highways & Public Works	H&PW	J. Caswell	(902)892-0291
6 Department of Tourism, Industry & Energy	TIE	A.J. Hiscock	(902)892-1051
7 Department of Agriculture & Forestry	F	F. Matheson	(902)892-0228

Provincial Agencies and Reporting Officers

Provincial Agency	Acronym	Reporting Officer	Telephone
QUEBEC			
1 Direction des programmes d'énergies nouvelles (Ministère de l'Energie et des Ressources)	DPEN	R. Pigeon Marcel Desjardins	(418)643-2109 (418)643-1283
2 Centre de recherche industrielle	CRI	C. Baronet	(418)659-1550
3 Institut de Recherche de l'Hydro-Québec	IRHQ	R. David	(514)652-8011
4 Institut National de la Recherche Scientifique - Pétrole	INRS-P	M. Desjardins	(418)643-1283
- Energie	INRS-E	J. Martel	(514)282-6812
5 Université Laval	UL	P. Pednau	(418)656-5623
6 Université de Montréal	UM	G. Bertiaume	(514)343-6797
7 Université de Sherbrooke	US	J.L. Lareau	(819)565-5525
SASKATCHEWAN			
1 Saskatchewan Agriculture	AG	E. Wrubleski	(306)565-6587
2 Department of Culture and Youth	C&Y	G. Tuck	(306)565-5761
3 Department of Northern Saskatchewan	DNS	D. Stuewe	(306)565-2908
4 Department of Education	EDUC	I. Brunas	(306)565-6040
5 Department of Industry and Commerce	I&C	B. Baron	(306)565-2208
6 Saskatchewan Telecommunications Corporation	Sask Tel	K. Kelln	(306)347-2048
7 Saskatchewan Forest Products Corporation	SFPC	N.S. Denmark	(306)764-4266
8 Saskatchewan Government Services	SGS	Gerry McKenzie	(306)565-3329
9 Saskatchewan Housing Corporation	SHC	A. Fowlie	(306)565-4154
10 Saskatchewan Minerals	SM	Dennis K. Storer	(306)395-2561
11 Saskatchewan Mining Development Corporation	SMDC	L.A. Clark	(306)664-6155
12 Saskatchewan Mineral Resources	SMR	J. Hutchinson	(306)565-3375
13 Saskatchewan Oil and Gas Corporation	SO	Brian Kristoff	(306)565-7088
14 Saskatchewan Power Corporation	SPC	M. Weekes	(306)359-1222
15 Saskatchewan Research Council	SRC	Dave Eyre	(306)664-5424
16 Saskatchewan Science Council	SSC	P. Nikiforuk	(306)343-2621
YUKON TERRITORY			
1 Government of Yukon Territory		R. Daxter	(403)667-5461

APPENDIX B

LIST OF REPORTS AVAILABLE FROM

PROVINCIAL AND TERRITORIAL GOVERNMENTS AND AGENCIES

APPENDIX B

LIST OF REPORTS AVAILABLE FROM
PROVINCIAL AND TERRITORIAL GOVERNMENTS AND AGENCIES

ALBERTA

Petroleum Recovery Institute

Report of the Interim Board of Directors: (1966-67)

Report of the Board of Directors, Annual Report of the Chief Research Officer: 1967-68 to 1974-75. (Free if still available).

Report of the Board of Directors, Annual Report of the Manager: 1975-76 to 1979-80. (Free if still available)

PRI News Letters: Numbers 1-22. (Free if still available).

Research Programs of PRI: RP-1 by N. Mungan (Feb. 1968). (Free if still available).

Progress Reports of PRI: (Free if still available).

PR-I	(October 1968)
to PR-XXV	(November 1980)

Research Reports of PRI: (RR 36 $60 each, other reports $10 each)

RR-1 (March 1968), "Programmed Mobility Control in Polymer Floods", by N. Mungan.

RR-2 (April 1968), "Permeability Reduction Due to Salinity Changes", by N. Mungan.

RR-3 (March 1969), "Rheology and Adsorption of Aqueous polymer Solutions", by N. Mungan.

RR-4 (June 1969), "Reservoir Statistical Analysis", by A.C.A Hope.

RR-5 (July 1969), "An Experimental Study of Fluid-Fluid and Fluid-Fluid-Solid Interfaces", by F.G. McCaffery and N. Mungan.

RR-6 (Oct. 1979), "Retrograde Condensation in Porous Media", by N.R. Morrow, R.A. Purvis and P.M. Sigmund.

RR-7 (Jan. 1971), "Wettability and Capillarity in Porous Media", by N.R. Morrow and N. Mungan.

RR-8 (March 1971), Dispersion in Porous Media", by M.J. Goss.

RR-9 (April 1971), A Review of Diffusion in Liquids and Dense Gases", by Hing Y. Lo and P.M. Sigmund

RR-10 (July 1971), "Diffusion Coefficients for the Liquid System n-Heptane - n- Dodecane", by Hing Y. Lo.

RR-11 (July 1971), "Rehological Model for Ionic Polyacrylamide Solutions", by N. Mungan.

RR-12 (Sept. 1971), "The Measurement of Interfacial Tensions and Contact Angles at High Temperature and Pressure", by F.G. McCaffery.

RR-13 (Oct. 1971), "Wetting and Adsorption Studies of the n-Dodecane-Aqueous Solution-Quartz System", by F.G. McCaffery and P.J. Cram.

RR-14 (March 1972), "Dispersion Measurements in Porous Media", by M.J. Goss.

RR-15 (June 1972), "Displacement Studies in Dolimite with Wettability Control by Octanoic Acid", by N.R. Morrow, P.J. Cram, and F.G. McCaffery.

RR-16 (Nov. 1972), "Diffusion Coefficient in Binary Liquid n- Alkane Systems", by Hing Y. Lo.

RR-17 (Dec. 1972), "Wettability Studies with Non-Hydrocarbon Constituents of Crude Oil", by P.J. Cram.

RR-18 (Nov. 1972), "Oil Well Coning", by T. Kaneko and N. Mungan.

RR-19 (April 1972), "Temperature Effect on Relative Permeabilities and Residual Saturations", by Hing Y. Lo and N. Mungan.

RR-20 (May 1973), "Some Ppractical Aspects of Coning Simulation", by N. Mungan, T. Kaneko, K. Aziz, and A. Settari.

RR-21 (June 1973), "Binary Molecular Diffusion in Dense Gas Mixtures: The Methane-Propane and Methane-Nitrogen Systems", by P.M. Sigmund.

RR-22 (Jan. 4, 1974), "The Effects of Surface Roughness on Contact Angle", by N.R. Morrow.

RR-23 (Jan. 16, 1974), "Capillary Phenomena in Uniformly Wetted Porous Media", by N.R. Morrow.

RR-24 (Feb. 8, 1974), "Dispersion Measurements for Miscible Flood Design", by M.J. Goss.

RR-25 (April 3, 1874), "The Measurement and Prediction of Molecular Diffusion for Estimating Mixing Effects in Petroleum Recovery Processes", by P.M. Sigmund.

RR-26 (July 25, 1974), "A Theoretical and Experimental Coning Study", by N. Mungan.

RR-27 (Nov. 21, 1974), "Estimating Multicomponent Diffusion and Dispersion for Petroleum Recovery Processes", by P.M. Sigmund.

RR-28 (April 3, 1975), "Revaporization Recovery of Retrograde Condensate by Dry Gas Injection", by P.M. Sigmund.

RR-29 (June 23, 1975), "Bibliography of Thermal Methods of Oil Recovery", by Hing Y. Lo.

RR-30 (Dec. 2, 1975), "Aqueous Polymer Solution Floods", by Walter P. Shyluk.

RR-31 (Aug. 1976), "Laboratory Study of Water Coning in a Layared Model", by N. Mungan.

RR-32 (Nov. 1976), "The Effect of Interfacial Tension on Oil-Water Relative Permeabilities", by Hing Y. Lo.

RR-33 (May 1977), "Pore Space Characterization and Displacement Studies of Alberta Carbonate Reservoir Rocks", by F.G. McCaffery, P.M. Sigmund, and J.E. Fosti.

RR-34 (May 1977), "An Improved Procedure for Determining the Relative Permeability Characteristics of Heterogeneous Porous Media", by P.M. Sigmund and F.G. McCaffery.

RR-35 (Oct. 1977), "Mobilization of Entrapped Ganglia", by J.P. Batycky and A.K. Singhal.

RR-36 (May 1978), "A Treatise on Hydrocarbon Recovery from Carbonate Reservoirs", by F.G. McCaffery, P.M. Sigmund and N.C. Wardlaw. $60 each.

RR-37 (Sept. 1978), " Phase Behavior and Displacement Studies of Carbon Dioxide-Hydrocarbon Systems", by J.I. Lee and P.M. Sigmund.

RR-38 (Nov. 1978), "Physical Model Study of Inverted Seven Spot Steamfloods in a Pool Containing a Lloydminster Type Heavy Oil", by A.K. Singhal.

RR-39 (Nov. 1978), "Polymer Solution Degradation and the Meaning of Screen Factor". by J.P Batycky and V.K. Masata.

RR-40 (March 1979), "Effectiveness of Carbon Dioxide Displacement Under Miscible and Immiscible Conditions", by J.I. Lee.

RR-41 (Feb. 1979), "Dependence of Residual Oil Mobilization on Wetting and Roughness", by J.P. Batycky.

RR-42 (April 1979), "Adsorption of Pure Surfactant and Petroleum Sulfonate at the Solid-Liquid Interface", by J. Novosad and L. Baxter.

RR-43 (May 1980), "Salinity and Hardness Tolerant Microemulsion Formulations", by B.B. Maini and J.P. Batycky.

RR-44 (May 1980), "Simulation of Miscible Displacement in Full Diameter Carbonate Cores", by J.P. Batycky, B.B. Maini and D.B. Fisher.

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RN-3 (Sept. 1975), "Interfacial Tensions anmd Aging Behavior of Some Crude Oils Against Connate Solutions", by F.G. McCaffery.

RN-4 (Aug. 1976), "Contact Angle and Interfacial Measurements on Reservoir Fluids and Rock Matrixes from Devonian Reservoirs in Alberta", by N. Mungan.

RN-5 (Jan. 1977), " An Investigation of the Gelation Tendencies of Pfizer's Biopolymer 1035", by F.G.McCaffery and F. Edillon.

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RN-7 (March 1978), "Species Distribution in Microemulsion Systems", by J. Novosad and J.P. Batycky.

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AR-1 (Dec. 1976), "Reserves of the Bodo Upper Mannville 'B' Pool with Paricular Reference to Delineation of Gas Caps and Underlying Water Zones", by E.N. Collins and D. James. $10 each.

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AR-3 (Aug. 1977), "Review of Microemulsion Flooding Processes", by M.I. Mirkin. $25 each.

AR-4 (Jan. 1979), "A Review and Evaluation of Alkaline Flooding", by N. Mungan. $50 each.

AR-5 (April 1979), "A review and Evaluation of Carbon Dioxide Flooding", by N. Mungan.

AR-6 (Sept. 1979), "Some Uses of Functional Analyses in Petro-physics", by E.N. Collins and D. Pilles. $10 each.

AR-7 (March 1980), "Enhanced Oil Recovery Potential in Alberta, Conventional Crude Oil Reservoirs, A Technological and Economic Evaluation", by B. Agbi and M. Mirkin. $25 each.

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IR-1 (Aug. 1976), "Surfactant Sorption Phenomena", by J.F. Kelly.

IR-2 (Oct. 1976), "Residual Oil", by N.R. Morrow.

IR-3 (Oct. 1976), "Potential Carbon Dioxide Supplies in Alberta", by E.N. Collins and J.P. Fontanilla.

IR-4 (March 1977), "Log-Core Study of Bodo Upper Mannville 'B' Pools", by E.N. Collins.

IR-5 (March 1977), "Laboratory Model History of Steam Flood Oil Recovery", by Hing Y. Lo.

IR-6 (May 1977), "Enhanced Oil Recovery Potential in Alberta Sandstone Reservoirs", by B. Agbi.

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81-1 (Jan. 1981), "Numerical Simulation of Laboratory Steam-flood Experiments", by M. Hayashitani, W. Davis, J. Novosad and J.P. Batycky. $10 each.

81-2 (Jan. 1981), "The Effect of Sodium-Hydrogen Ion Exchange on Alkalinity Loss in Alkaline Flooding", by Z. Novosad and J. Hodges. $10 each.

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81-4 (March 1981), "The Evaluation of Interblock Mobility Using a Modified Midpoint Weighting Scheme", by Y. Ito. $10 each.

81-5 (March 1981), "A Geological Study of Three Mannville Sand Reservoirs - Chauvin South (Sparky A and B), Provost (Upper Mannville B), and Bodo David (Lloydminster A)", by A.A. Gross. $25 each.

81-6 (March 1981), "Methods of In Situ Saturation Determination During Core Tests Involving Multiphase Flow", by D.N. Saraf. $10 each.

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"Permeability Reduction Due to Salinity Changes", by N. Mungan, Journal of Canadian Petroleum Technology, V. 7, No. 3, pp. 113-117 (July - September 1968).

"Le controle de la Mobilite dans les Injections de Polymeres", by N. Mungan, Revue de L'Institut Français du Petrole, V. XXIV, p. 232 (Feb 1969).

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"Evaluation of the Capillary Pressure Curve Techniques for Determining Pore Size Distribution - A Network Approach", by B.P. Pandey and A.K. Singhal, Powder Technology, V. 15, pp. 89-96 (1976).

"Effect of Heterogenous Wettability on Flow of Fluids Through Porous Media", by A.K. Singhal, D.P. Mukherjee and W.E. Somerton, Journal of Canadian Petroleum Technology, V. 15, No. 3, pp. 63-70 (July-September 1976).

"Interfacial Tensions and Aging Behaviour of Some Crude Oils Against Caustic Solutions", by F.G. McCafferty, Journal of Canadian Petroleum Technology, V. 15, No. 3, pp. 71-74 (July-September 1976).

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"Recovery of Retrograde Condensed Liquids by Revaporization During Dry Gas Injection", by P.M. Sigmund and A.M. Cameron, Journal of Canadian Petroleum Technology, V. 16, No. 1, p. 64 (January-March 1977).

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"Pore Space Characterization and Displacement Studies of Alberta Carbonate Reservoir Rocks", by F.G. McCafferty, P.M. Sigmund, and J.E. Fosti, Trans. CWLS, 6th Formation Evaluation Symposium, Paper B, (October 24-26, 1977).

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"Some Aspects of Geological Contribution to EOR - Comparison of the Geometry of Three Manville Sand Resevoirs", by A.A. Gross, Paper presented at CIM Annual Meeting, Calgary (May, 1981).

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CMG.R2.01: Iterative Methods for Flash Calculations Using the Soave-Redlich-Kwong or the Peng-Robinson Equations of State

CMG.R2.02: The Development of a One-Dimensional Miscible-Immiscible Simulator and Its Application in CO_2 Displacements

CMG.R4.01: Multiphase Flash Calculation in In Situ Combustion Simulation

CMG.R4.04: The Generalized Crank-Nicholson Method for Reducing Time Trunciation Errors in Resevoir Simulation

CMG.R6.01: A Preliminary Evaluation of Direct Elimination Techniques for Reservoir Simulation Problems

CMG.R6.02: Block Iterative Methods for Fully Implicit Reservoir Simulation

CMG.R7.01: Compositional Modeling with an Equation of State

CMG.R7.02: A Viscosity Model for Reservoir Fluids

CMG.R7.04: A Method for Handling as Solubility in the Water Phase for Compositional Models

CMG.R8.01: Static Fracture Model

CMG.R8.02: Modelling Infinite-Conductivity Vertical Fractures Using Source and Sink Terms

CMG.R8.03: A Fully Implicit Hydraulic Fracture Model

CMG.R9.01: Elimination of the Constraint Equation and Modelling of Problems with a Non-Condensable Gas in Steam Simulation

CMG.R10.02: Techniques for Fully Implicit Resevoir Simulation

CMG.R10.03: Results for the Comparative Solution Project

CMG.R11.01: The Development of a Model for Pressure or Rate Constrained Wells Passing Through Several Grid Blocks

CMG.R11.02: A Multi-Layered Fully Implicit Well Model

CMG.R13.01: The Method of Moments and Related Spin-Offs

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ISCOM User Manual (CMG.R4.02)	In Situ Combustion model
MISIM3 User Manual (CMG.R7.03)	Miscible-Immiscible model
BLAKO User Manual (CMG.R10.01)	Black Oil model

Coal Mining Research Center

CMRC 81/19-T "The Purpose and Practice of Coal Preparation in Canada", by S.G. Butcher and P.L. Wright.

CMRC 81/20-AD "Annual Report of Manager to CMRC Members and to A/CERRF Committe for 1980/81", by K. Barron.

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CMRC 81/36-BG Spoil Stabilization - Some Concepts, by D. Fawcett.

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32-13	"The Attachment of Insulation to Existing built-up Roofs" by Alberta Roofing Contractors Association Atd., August 1981.
U-25	"Structure of Coal Bearing Strata near Cadomin" by Dr. H. A. K. Charlesworth, University of Alberta
U-8	"Geothermical energy Resources of Alberta" by Dr. F. W. Jones, University of Alberta
U-10	"Control of Energy Losses by Microbial Fouling of Heat Exchangers in Thermal Energy Recovery Operations" by Dr. J. W. Costerton, University of Calgary.
U-80-7	"Development of a Process for Production of Activated Carbon from Coal" by Dr. E. L. Tollefson, University of Calgary.

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Science Council

The following reports are available for general circulation:

1. Survey of Doctoral Degree Recipients from B.C. and Canadian Univeresities (1976);
2. Research and Development Policy for B.C., March 1979;
3. Research and Development in British Columbia, June 1979;
4. Scientific Activities of the Government of British Columbia 1978-79 Survey Results;
5. Scientific Activities of the Government of British Columbia 1979-80 survy Results;
6. First Annual Report, Science Council of British Columbia, for the year ended March 31, 1979;
7. Second Annual Report, Science Council of British Columbia, for the year ended march 31, 1980.

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8103	Microwave Ovens

British Columbia Hydro, Technical Publications

A. Chemical Research

a) I. Webber
"The Efficient Use of Fuller's Earth on Reclaiming Used Insulating Oil"
CEA Conference Montreal, March 1980.

b) I. Webber
"Radical Reactions in Rhenium Carbonyls"
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c) D.R. Pugh
"PCB in Oil Analysis
CEA Conference, Vancouver, June 1979

d) I. Webber
"Fuller's Earth Oil Reclamation"
Hydro Operations Seminar (Boundary Road Personnel

B. Electrical Research

a) H.E. Orton
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b) B.E. Ward
"An Accelerated Ageing Test Program for Generator Stator Insulation" presented to the Cage Club, Regina, May 1979.

c) L.A. Snider
"The Principles and Practice of Insulation Co-ordination"
8th Copimera Congress, San Salvador, October 1979

d) L.A.Snider, D. McGillis, J.J. Archambault
"Phase-to-Phase Insulation Co-ordination"
CEA - Montreal, March 1980.

C. Materials Research

a) D.E. Franklin, J.A. MacDonald and G.K. Chow
"portable Field Governor test Set - Experiences"
Presentation to CEA Hydraulic Power Section, March 1980.

b) A. Akthar, N. Streat and J.E. Drakos
"Fault Current Damage to Pipelines Occupying Joint-Use corridors with Overhead AC Transmission Lines"
The American Society for Metals Conference, May 1980.

d) A. Akhtar and N.W. Brodie
"Thermo-Mechanical Processing of Hydro-Turbine Steels"
to be published in the Proceedings of the Conference on "Materials to Supply the Energy Demand"
May 1980, American Society for Metals.

e) N.W. Brodie
"Design Aircraft WArning Markers to Avoid Aeolian Vibration and Electrical Discharge Damage"
CEA Workshop on the Control of Transmission Line Vibration, March 1980, Montreal

D. General

a) H.M. Ellis & J.R. Leslie
"Planning and Implementation of Research for the Benefit of Canadian Power Systems"
CIGRE #41 Conference, Victoria, July 1979

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The Wood Book

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Subsidiary Agreement Energy Conservation Canada/Nova Scotia as signed July 4, 1978.

Energy Update 1978

A folder of energy consumption statistics for 1978.

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A comprehensive review of energy supply and demand in Nova Scotia in 1977, accompanied by historical data. (Charge of $2.75 per copy for each request.)

Energy Alternatives Nova Scotia 1987 Respondent's Report

A Delphi Survey conducted for the Nova Scotia Energy Council (1978) by the Bureau of Management Consulting, Department of Supply and Services.

Refined Petroleum Product Requirements in Nova Scotia 1977-1997

Information was gathered from the major petroleum consumers as to how they felt their petroleum requirements would change and the factors that would influence these changes.

Before the National Energy Board Re Canadian Natural Gas Supply and Demand

Submission by: the Province of Nova Scotia, September, 1978.

Evaluation of Potential Markets for Natural Gas in Nova Scotia

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Booklet explaining the Industrial Retrofitting Grant Program of the Province of Nova Scotia, Department of Mines and Energy and the Government of Canada, Regional Economic Expansion.

A Case Study Wood Energy for Small Industry, Oxford, Nova Scotia

For the Nova Scotia Energy Council by Whitman, Benn and Associates Ltd. (Charge of $10.00 per copy.)

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Wind power report (November 1975)	$3.00

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